

Wood Environment & Infrastructure Solutions, Inc. 271 Mill Road, 3rd Floor Chelmsford, MA 01824 USA

T: 978-692-9090

www.woodplc.com

Mr. James M. DiLorenzo
Remedial Project Manager
United States Environmental Protection Agency
Office of Site Remediation and Restoration
5 Post Office Square, Suite 100
Mail code: OSRR07-4
Boston, Massachusetts 02109-3912

Subject: Semi-Annual Status Report No. 24

October 2018 through March 2019 Olin Chemical Superfund Site

51 Eames Street

Wilmington, Massachusetts

Dear Mr. DiLorenzo:

July 3, 2019

On behalf of Olin Corporation, Wood Environment & Infrastructure Solutions, Inc. (Wood), formerly Amec Foster Wheeler, is submitting this "Semi-Annual Status Report No. 24, Olin Chemical Superfund Site, 51 Eames Street, Wilmington, Massachusetts." A CD copy is being sent directly to Mr. Garry Waldeck of the MassDEP. This report is being submitted in accordance with the requirements specified in Sections 1.III.E and 2.II.C of the Final Statement of Work (SOW) for the Olin Chemical Superfund Site. The SOW is incorporated by reference into the Administrative Settlement Agreement and Order of Consent for Remedial Investigation and Feasibility Study for the Olin Chemical Superfund Site, Wilmington, Massachusetts (USEPA CERCLA Docket No. 01-2007-0102).

This document was prepared for the sole use of Olin Corporation and the United States Environmental Protection Agency, the only intended beneficiaries of our work. No other party shall rely on the information contained herein without prior written consent of Wood Environment & Infrastructure Solutions, Inc.

At your request, we are providing copies of these deliverables directly to the following recipients:

Garry Waldeck - MassDEP (1 electronic copy)

Jeff Brunelle - Nobis Engineering, Inc. (1 hard copy, 1 electronic copy)

Jeffrey Hull - Town of Wilmington (2 hardcopies, 2 electronic copies)

Martha Stevenson - WERC (2 hardcopies, 2 electronic copies)

Page 2

If you have any questions concerning this deliverable, please do not hesitate to contact Mr. Chinny Esakkiperumal, Olin Corporation, at 423-336-4675.

Sincerely,

Wood Environment & Infrastructure Solutions, Inc.

Elizabeth T. Bowen

Project Manager

Peter H. Thompson

Senior Principal Hydrogeologist

cc: James Cashwell – Olin Chinny Esakkiperumal – Olin Garry Waldeck - MassDEP Jeff Brunelle - Nobis Engineering, Inc. Jeffrey Hull - Town of Wilmington Martha Stevenson - WERC

wood.

Semi-Annual Status Report No. 24

Olin Chemical Superfund Site 51 Eames Street, Wilmington MA 6107190016

Prepared for:



Semi-Annual Status Report No. 24

Olin Chemical Superfund Site 51 Eames Street, Wilmington, MA

6107190016

Prepared for:

Olin Corporation 3855 North Ocoee Street, Suite 200, Cleveland TN 37312

Prepared by:

Wood Environment & Infrastructure Solutions, Inc. 271 Mill Road 3rd Floor Chelmsford, MA 01824 USA T: 978-692-9090

3-Jul-19

Prepared and Reviewed by:

yabet J. Bower

Elizabeth T. Bowen Project Manager Peter Thompson

Senior Principal Hydrogeologist

Copyright and non-disclosure notice

The contents and layout of this report are subject to copyright owned by Wood. (© Wood Environment & Infrastructure Solutions, Inc.) save to the extent that copyright has been legally assigned by us to another party or is used by Wood under license. To the extent that we own the copyright in this report, it may not be copied or used without our prior written agreement for any purpose other than the purpose indicated in this report. The methodology (if any) contained in this report is provided to you in confidence and must not be disclosed or copied to third parties without the prior written agreement of Wood. Disclosure of that information may constitute an actionable breach of confidence or may otherwise prejudice our commercial interests. Any third party who obtains access to this report by any means will, in any event, be subject to the Third-Party Disclaimer set out below.

Third-party disclaimer

Any disclosure of this report to a third party is subject to this disclaimer. The report was prepared by Wood at the instruction of, and for use by, our client named on the front of the report. It does not in any way constitute advice to any third party who is able to access it by any means. Wood excludes to the fullest extent lawfully permitted all liability whatsoever for any loss or damage howsoever arising from reliance on the contents of this report. We do not however exclude our liability (if any) for personal injury or death resulting from our negligence, for fraud or any other matter in relation to which we cannot legally exclude liability.

Table of contents

1.0	INTROD	DUCTION	1
2.0	SLURRY	' WALL/CAP	2
	2.1	Groundwater	2
	2.2	Surface Water	4
	2.3	Sediment	4
	2.4	Data Logger Data	5
	2.5	Temporary Cap Inspection	5
3.0	PLANT	В	6
	3.1	Groundwater	6
	3.2	Light Non-Aqueous Phase Liquid	7
4.0	DAPL EX	XTRACTION	8
	4.1	Operations Status	8
	4.2	Reporting Status	8
5.0	ADDITIO	ONAL ACTIVITIES	9
	5.1	Major Submittals, Meetings and Other RI/FS Activities	9
	5.2	Residential Drinking Water Sampling	
	5.3	Plant B Pumping Rate Reduction Test	10
	5.4	OU1 and OU2 Remedial Investigation Sampling and Analytical Results	10
	5.5	OU3 Remedial Investigation Groundwater Sampling and Analytical Results	10
	5.6	Calcium Sulfate Landfill	
6.0	REFERE	NCES	11
		List of tables	
Table 2- Table 2- Table 2- Table 2- Table 2-	-2 -3 -4	Slurry Wall/Cap Analytical Results for Fourth Quarter 2018 Groundwater Sampling Slurry Wall/Cap Analytical Results for First Quarter 2019 Groundwater Sampling Slurry Wall/Cap Analytical Results for Fourth Quarter 2018 Surface Water Sampling Slurry Wall/Cap Analytical Results for First Quarter 2019 Surface Water Sampling Slurry Wall/Cap Analytical Results for Fourth Quarter 2018 Sediment Sampling	
Table 3- Table 3- Table 3- Table 3- Table 3-	-2 -3 -4	Plant B Analytical Results for RGP Sampling (October 2018 – March 2019) Plant B Analytical Results for Fourth Quarter 2018 Groundwater Sampling Plant B Analytical Results for First Quarter 2019 Groundwater Sampling Plant B Water Level and Product Recovery Data: October 2018 – December 2018 Plant B Water Level and Product Recovery Data: January 2019 – March 2019	
Table 5- Table 5-		Private Well Analytical Results for the Fourth Quarter 2018 Private Well Analytical Results for the First Quarter 2019	
		List of figures	
Figure 1 Figure 1		Site Location Site Plan	
Figure 2 Figure 2		Slurry Wall/Cap Interpreted Water Level Contours – Fourth Quarter 2018 Slurry Wall/Cap Interpreted Water Level Contours – First Quarter 2019	
Figure 3 Figure 3 Figure 3	3-2	Plant B Interpreted Water Level Conditions – October 30, 2018 Plant B Interpreted Water Level Conditions – November 27, 2018 Plant B Interpreted Water Level Conditions – December 27, 2018	

wood

Figure 3-4	Plant B Interpreted Water Level Conditions – January 30, 2019
Figure 3-5	Plant B Interpreted Water Level Conditions – February 26, 2019
Figure 3-6	Plant B Interpreted Water Level Conditions – March 29, 2019
Figure 3-7	Plant B Interpreted LNAPL Thickness Contours – October 30, 2018
Figure 3-8 Figure 3-9	Plant B Interpreted LNAPL Thickness Contours – November 27, 2018 Plant B Interpreted LNAPL Thickness Contours – December 27, 2018
Figure 3-9	Plant B Interpreted LNAPL Thickness Contours – January 30, 2019
Figure 3-11	Plant B Interpreted LNAPL Thickness Contours – February 26, 2019
Figure 3-12	Plant B Interpreted LNAPL Thickness Contours – March 29, 2019
Figure 3-13	Monthly and Cumulative LNAPL Recovery
Figure 3-14	Water Levels (WL) and Monthly LNAPL Recovery
•	
Figure 5-1	Calcium Sulfate Landfill Monitoring Locations
	List of appendices
Appendix A	Interim Response Steps Field Activity Reports
Appendix A-1	Fourth Quarter 2018 Sampling Event
Appendix A-2	First Quarter 2019 Sampling Event
Appendix B	Data Validation Memoranda (<i>Provided on CD</i>)
Appendix B-1	Fourth Quarter 2018 Sampling Event
Appendix B-2	First Quarter 2019 Sampling Event
Appendix B-3	Additional Sampling Events
Appendix B-4	Unvalidated Data
Appendix C	Weir Monthly Inspection Reports: October 2018 – March 2019
Appendix D	Slurry Wall/Cap Groundwater, Surface Water, and Sediment Time Series Plots
Appendix D-1	Groundwater (Aluminum, Ammonia, Chloride, Chromium, Sulfate)
Appendix D-2	Surface Water (Aluminum, Ammonia, Chloride, Chromium, Sulfate)
Appendix D-3	Sediment (Aluminum, Chromium, Iron)
Appendix E	Slurry Wall/Cap Data Logger Water Level Plots
Appendix E-1	Groundwater Elevation (Corrected for Barometric Pressure) and Precipitation – Fourth Quarter
	2018
Appendix E-2	Groundwater Elevation (Corrected for Barometric Pressure) and Precipitation – First Quarter 2019

List of acronyms

	List of acronyr
AMEC	AMEC Environment & Infrastructure, Inc.
ВЕНР	Bis(2-ethylhexyl)phthalate
CSL	Calcium Sulfate Landfill
DAPL DMF	Dense Aqueous Phase Liquid Dimethylformamide
EE/CA	Engineering Evaluation/Cost Analysis

EPH Extractable Petroleum Hydrocarbons

6107190016 | 7/3/2019 Page i



IRS Interim Response Steps

IRSWP Interim Response Steps Work Plan

ISCO In-situ Chemical Oxidation

LNAPL Light Non-aqueous Phase Liquid

MACTEC Engineering and Consulting, Inc.

Massachusetts Department of Environmental Protection

MS/MSD Matrix Spike/Matrix Spike Duplicate
MSA Method of Standard Additions

µg/L Micrograms per Liter mg/L Milligrams per Liter

NDMA N-nitrosodimethylamine NDPhA N-nitrosodiphenylamine NDPrA N-nitroso di-n-propylamine

Olin Corporation

off-PWD off-Property West Ditch

OU Operable Unit

QA/QC Quality Assurance/Quality Control

RAE Remedial Alternatives Evaluation RGP Remediation General Permit RI Remedial Investigation

RI/FS Remedial Investigation/Feasibility Study

RPD Relative Percent Difference

SASR Semi-Annual Status Report

Site Olin Chemical Superfund Site

SVOC Semi-Volatile Organic Compound

TAL TestAmerica Laboratories, Inc.

TDS Total Dissolved Solids
TOC Total Organic Carbon
TSS Total Suspended Solids

USEPA United States Environmental Protection Agency

VOC Volatile Organic Compound
VPH Volatile Petroleum Hydrocarbon

Wood Wood Environment & Infrastructure Solutions, Inc.

6107190016 | 7/3/2019 Page ii



1.0 INTRODUCTION

This Semi-Annual Status Report (SASR) has been prepared for the Olin Chemical Superfund Site (the Site) in Wilmington, Massachusetts, on behalf of Olin Corporation (Olin) by Wood Environment & Infrastructure Solutions, Inc. (Wood, formerly Amec Foster Wheeler). The SASR has been prepared consistent with Section 2.II.C. of the Statement of Work, Remedial Investigation/Feasibility Study (RI/FS), Olin Chemical Superfund Site, prepared by the United States Environmental Protection Agency (USEPA) Region I – New England and dated June 2007 (USEPA, 2007). This SASR summarizes the monitoring activities conducted from October 2018 through March 2019 and presents monitoring data and analytical results including, but not limited to, groundwater, surface water, and sediment data from the Slurry Wall/Cap and Plant B monitoring programs.

The Site location is presented in **Figure 1-1**. **Figure 1-2** is a Site plan that identifies the three areas that are described in the Interim Response Steps Work Plan (IRSWP) including Slurry Wall/Cap Containment Area, Plant B, and the off-Property West Ditch (OPWD) area. This SASR summarizes field and reporting activities for the three areas where Interim Response Steps (IRS), as described in the IRSWP and DAPL Extraction Study, are being conducted.

The three specific IRSs include:

- Slurry Wall/Cap monitoring of groundwater, surface water, and sediment in the area surrounding the Slurry Wall and inspection of the temporary cap;
- Plant B operation, maintenance, and monitoring of the groundwater recovery/treatment system that was designed to remove and control migration of light non-aqueous phase liquid (LNAPL); and
- Dense Aqueous Phase Liquid (DAPL) Extraction Design, installation and operation of a pilot study to evaluate the efficacy of DAPL extraction in the OPWD Area.

6107190016 | 7/3/2019 Page 1 of 1



2.0 SLURRY WALL/CAP

The following sections present results of chemical analyses for groundwater, surface water, and sediment samples associated with the slurry wall/cap during the fourth quarter of 2018 and first quarter of 2019. Groundwater level data for the fourth quarter of 2018 and first quarter of 2019 are presented in the field activity reports contained in **Appendices A-1 and A-2**. The data validation memoranda for these sampling events are provided in **Appendices B-1 and B-2**, respectively. The results of these analyses are generally consistent with past results.

Olin personnel conducted weekly observations of the weir and South Ditch and recorded observations concerning wildlife, surface water conditions, and flocculent accumulation. These reports are reviewed by Wood and compiled in separate monthly reports, which are provided for the current reporting period in **Appendix C**.

2.1 Groundwater

Groundwater sampling and analysis for the fourth quarter of 2018 sampling event was completed from November 14th through 28th, 2018. The first quarter of 2019 sampling event was completed from April 3rd through 4th, 2019. Note, the first quarter sampling was implemented in April due to winter weather conditions and associated personnel safety.

The fourth quarter of 2018 sampling event included groundwater sample collection from 15 monitoring wells: GW-10S, GW-24, GW-25, GW-34SR, GW-34D, GW-35S, MP-2 #15, GW-43SR, GW-76S, GW-78S, GW-79S, GW-201S, GW-202S, GW-202D, and GW-CA1; and five piezometers: PZ-16RRR, PZ-17RRR, PZ-18R, PZ-24, and PZ-25 located along the South Ditch consistent with the Final IRSWP. The first quarter of 2019 sampling event included groundwater sample collection from five monitoring wells: GW-25, GW-78S, GW-79S, GW-202S, and GW-202D; and five piezometers: PZ-16RRR, PZ-17RRR, PZ-18R, PZ-24, and PZ-25.

Quality Assurance/Quality Control (QA/QC) samples include two field duplicates and matrix spike/matrix spike duplicates (MS/MSD).

The sample locations, details of sampling, and the analytical program are identified in the field activity reports. Field activity reports for the fourth quarter of 2018 and first quarter of 2019 sampling events are contained in **Appendices A-1 and A-2**, respectively. The field activity reports also contain tabulated final field parameter measurements collected at the time of sampling, sample collection field data records, and instrument calibration records. Groundwater samples were analyzed by TestAmerica Laboratories, Inc. (TAL) for ammonia, chloride, sulfate, specific conductance and filtered samples are analyzed for aluminum and chromium.

Table 2-1 and Table 2-2 summarize groundwater analytical results for referenced quarterly samples. The data validation memoranda for groundwater and surface water are included in **Appendices B-1 and B-2** and conclude that TAL results are useable as reported by the laboratory unless otherwise indicated in the validation report.

Appendix D-1 presents time series groundwater concentration plots for aluminum, ammonia, chloride, chromium, specific conductance, and sulfate from the south, southeast, west, and north areas surrounding the Containment Area. These plots include both current and historic data. Groundwater analytical data for monitoring well GW-43SR (west of the Containment Area) was added to **Appendix D** when it was replaced in November 2010, and piezometers PZ-24 and PZ-25 were added in June of 2011 at the request of USEPA. Piezometer PZ-24 and well GW-35S are interior to the Containment Area, while one well (GW-CA1) is located within the gravel equalization window of the Containment Area.

6107190016 | 7/3/2019 Page 2 of 1

In general, the analytical results for dissolved metals (aluminum and chromium) in groundwater samples collected from within the Containment Area (GW-35S, GW-CA1, and PZ-24), south of the Containment Area (GW-78S, GW-202S, GW-202D, PZ-17RRR, PZ-18R, and PZ-25), southeast of the Containment Area (GW-79S, GW-201S, PZ-16RRR), west of the Containment Area (GW-24, GW-25, GW-42S (MP-2#15), GW-43SR, GW-76S), and north of the Containment Area (GW-10S, GW-34D, GW-34SR) are consistent with historical data and the previous reporting period and are stable within historical ranges (**Appendix D-1**, **Figures D-1.1 through D-1.10**).

Concentrations of dissolved aluminum and chromium in GW-202D (filtered samples) have declined from the maximum concentrations detected in 2008 and 2009 and have stabilized over the past several years (chromium) or continue to decline (aluminum). **Figure D-1.8** suggests an increase in the chromium concentration at well MP-2. Review of field data records indicates that during the 4th quarter 2018 sampling event, a sample was collected from MP-2#15 (at a depth of 10.5 feet) rather than MP-2#13 (at a depth of 13.5 feet). The most recent result exhibits typical variability for this well, which will continue to be monitored as requested. Data collected during future sampling events will be reviewed to determine if chromium concentrations at this location are increasing, or if the 4th quarter 2018 analytical result was anomalous and a function of sampling MP-2#15 rather than MP-2#13 as required by the sampling program.

The analytical results for ammonia in groundwater samples are consistent with historical data and are stable within historical ranges (**Figures D-1.11 through D-1.15**). Concentrations of ammonia in groundwater samples from locations GW-202D, GW-202S, PZ-16RRR, GW-78S, GW-79S, PZ-24, PZ-25, GW-79S, PZ-17RRR, 16RRR, GW-25, and GW-24 have declined from the maximum concentrations detected in 2008 and 2009 and have either remained consistent for the last several years or have continued to decline. GW-18R immediately upstream from the weir continues to show the greatest variability, however recent seasonal maximum concentrations are lower than those measured from 5 to 10 years ago. The concentrations detected in PZ-18R continue to show seasonality with the highest concentrations occurring in spring (May-June) and lowest levels occurring in the fall (November) **Figure D-1.11**. PZ-18R ammonia concentrations are usually higher than those found in groundwater (GW-202D and GW-202S) or in downstream pore water underlying South Ditch (PZ-17RRR).

Sulfate and specific conductivity have declined in GW-202S to concentrations that are generally consistent with historical data and are within historical ranges at other wells (**Figures D-1.21 through D-1.30**). Specific conductivity and sulfate concentrations are consistent in PZ-18R and GW-202D and continue to show the largest seasonal fluctuations.

Concentrations of chloride south of the Containment Area at GW-202S have increased slightly since 2012 (**Figure D-1.16**) but have now stabilized. This may reflect upgradient sources as described below.

Concentrations of chloride and specific conductivity located west and up gradient of the Containment Area have increased since 2010 at locations GW-24, GW-25, MP-2#13, and GW-43SR (**Figure D-1.18 and D-1.28**) and are interpreted to reflect industrial development activities and increased use of de-icing salts on adjacent properties since other sample parameter concentrations (aluminum, ammonia, chromium, sulfate) have not increased over that same period. Chloride and specific conductivity concentrations detected at location GW-76S have decreased since highs in 2013 (**Figure D-1.18 and D-1.28**). The highest concentrations of chloride in PZ-18R are seasonal as described above. Shallow groundwater on the south side of the Containment Area (GW-202S) has shown a similar pattern of slightly increasing chloride concentrations during the same time frame (**Figure D-1.16**).

Groundwater levels were measured from select groundwater monitoring wells and piezometers prior to each sampling event. Water level measurements are tabulated in **Appendices A-1 and A-2**. These measurements and the interpreted groundwater potentiometric surfaces are depicted on **Figures 2-1**

6107190016 | 7/3/2019 Page 3 of

and 2-2. The water levels and interpreted groundwater potentiometric surface for the fourth quarter of 2018 and first quarter of 2019 are consistent with prior periods.

2.2 Surface Water

The fourth quarter of 2018 and first quarter of 2019 Surry Wall/Cap sampling events include the collection of surface water samples from seven locations ISCO-1, ISCO-2, ISCO-3, PZ-16RRR, PZ-17RRR, PZ-18R, and SD-17. Note, no sample was collected at location ISCO-3 during the fourth quarter due to deep mud impeding access to the South Ditch. Unfiltered samples were analyzed by TAL for aluminum, chromium, sodium, ammonia, chloride, nitrate, nitrite, sulfate, and specific conductance. In addition, filtered surface water samples were analyzed for metals: aluminum, chromium, and sodium. QA/QC samples include one field duplicate and one MS/MSD. The sample locations, details of sampling, and the analytical program are identified in the field activity report in **Appendix A-1 and A-2**.

Table 2-3 and Table 2-4 summarizes surface water analytical results for samples collected during the fourth quarter of 2018 and first quarter of 2019 sampling events. The surface water data validation memorandum is included in **Appendix B** and concludes that TAL's results are useable as reported by the laboratory unless otherwise indicated in the validation report.

Appendix D-2 presents time series surface water concentration plots for dissolved aluminum, dissolved chromium, ammonia, chloride, sulfate, and specific conductivity from the Upper South Ditch and Lower South Ditch areas. These plots include historic data along with data from the fourth quarter of 2018 and the first quarter of 2019 sampling events.

Detected concentrations and temporal patterns of the metals and inorganic parameters are consistent and within historical ranges from samples collected in the Upper South Ditch and Lower South Ditch. Dissolved aluminum and dissolved chromium in surface water from the Upper South Ditch and Lower South Ditch have decreased consistently since 2008 at sample location PZ-16RRR and since 2013 at sample locations SD-17 and ISCO-2 (Figures D-2.1 through D-2.4). Chromium now shows little seasonal variability. Ammonia, sulfate, and specific conductance in surface water samples have also decreased and stabilized since 2009 in the Upper South Ditch and Lower South Ditch and exhibit some seasonal variability (Figures D-2.5 through D-2.12). Concentrations in surface water above the weir (PZ-18RSW and ISCO-1) are lower than concentrations below the weir and have remained more stable (lacking indications of seasonality). Concentrations of chloride appear to have increased slightly since 2008 and 2009 in Upper South Ditch at locations ISCO-1 and PZ-18R and Lower South Ditch at location ISCO-3 consistent with trends in upgradient groundwater (Figures D-2.7 and D-2.8). It is assumed that these changes are the results of increased use of de-icing road salt at commercial operations along adjacent properties and roadways.

2.3 Sediment

Sediment samples were collected during the fourth quarter of 2018 sampling event from five locations SD-SD1, SD-SD2, SD-SD3, SD-SD4, and SD-SD5. QA/QC samples include one duplicate and one MS/MSD. These samples were analyzed for aluminum, chromium, iron, percent moisture, and percent solids.

Table 2-5 presents the analytical results for the fourth quarter of 2018 sediment sampling event. The data validation memorandum for sediment is included in **Appendix B** and concludes that results are useable as reported by the laboratory unless otherwise indicated in the validation report.

Appendix D-3 presents time series sediment concentration plots (**Figures D-3.1 through D-3.3**) for aluminum, chromium, and iron. These plots include shallow sediment data (collected between June 2003 and November 2018) for the sampled locations. Elevated detections of aluminum, chromium, and iron collected in 2016 and 2017 at locations SD-2, SD-3, and SD-5, have since decreased and are within historical

6107190016 | 7/3/2019 Page 4 of 1

ranges of detected concentrations at these locations. The elevated concentrations in 2017 were likely attributable to the presence and incorporation of floc into the sediment sample. Based on the 2018 analytical results and trend graphs, total aluminum, chromium, and iron have been within historical ranges and indicate that post-remediation recontamination of the sediment is not occurring. We will continue to monitor the concentrations to ensure and verify trends.

2.4 Data Logger Data

Data loggers are deployed in 10 monitoring wells and piezometers: GW-10S, GW-35S, GW-CA1, GW-76S, GW-78S, GW-CA3S, GW-CA4S, GW-6S, PZ-24, and PZ-25, to continuously monitor groundwater elevation within and outside the Containment Area. **Appendix E** presents time series groundwater elevation plots (**Figure E-1 and Figure E-2**) compared to precipitation data measured at the Site. These plots include groundwater elevations from October 2018 through March 2019 and have been corrected for barometric pressure using Site specific barometric pressure data. The data acquisition rate remains one reading every hour.

Continuous water level data plots indicate groundwater within and outside of the Containment Area responds to recharge of the aquifer. There were not many recharge rain events in the second quarter and third quarter of 2018 which led to groundwater recession and elevation lows from April through July. Several significant rain events in the end of October and into November 2018 led to seasonal water elevation highs at the end of November 2018. Comparison of water levels in GW-35S and GW-CA1 indicates an outward flow gradient through the equalization window from November 2018 through March 2019. The continuous outward flow gradient since November may be related to the condition of the cap.

2.5 Temporary Cap Inspection

As detailed in SASR No. 18, the official temporary cap inspection frequency was reduced from quarterly to semi-annually. The inspection for the fourth quarter of 2018 was conducted on November 16, 2018 and for the first quarter of 2019 was conducted on March 29, 2019. The inspection field data records, which indicates observations, maintenance, and repairs completed on the temporary cap, is included in Appendix C of the fourth quarter of 2018 and first quarter of 2019 field activity reports (FARs) attached in **Appendix A**.

As stated previous SASRs, Olin continues to perform additional random inspections to ensure that potential maintenance needs are addressed in a timely fashion.

A portion of the polyethylene geomembrane has torn and is no longer serviceable. Olin is evaluating options for repair or replacement of the geomembrane and will advise USEPA of results of that evaluation prior to scheduling repair or replacement activities.

6107190016 | 7/3/2019 Page 5 of 12

3.0 PLANT B

The following sections present results of chemical analysis of groundwater for the fourth quarter of 2018 and first quarter of 2019 Plant B sampling events. Groundwater level data from these sampling events are presented in field activity reports contained in **Appendices A-1 and A-2**. The data validation memoranda for the fourth quarter of 2018 and first quarter of 2019 are provided in **Appendices B-1 and B-2**, respectively.

Olin personnel collected monthly water level, LNAPL thickness, LNAPL recovery data, and sampled the treatment plant influent and effluent in accordance with the Remediation General Permit (RGP) requirements. Samples are analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), total metals, hexavalent chromium, chloroform, total phenols, residual chlorine, total suspended solids (TSS), chloride, and pH. The analytical program for the RGP was described in the IRSWP (MACTEC, 2008) and is subject to revision under a new permit. The analytical data for the RGP are retained on-Property by Olin in accordance with that permit. Plant B sampling frequencies continue on a monthly basis. Treated groundwater is stored in the newly installed on-Site Plant B aboveground storage tanks (ASTs) and sampling is completed prior to discharge. A summary table of Plant B influent and treated water data is presented in **Table 3-1**. The monthly water level and LNAPL thickness data (October 2018 – March 2019) are summarized in **Tables 3-4 and 3-5** and **Figures 3-1 through 3-12**.

East Ditch observations are made from the embankment on a daily basis during normal working days by the Olin staff. The Plant B Water Treatment Plant Daily Report contains a check box for observation of LNAPL related sheens in the East Ditch. This check box is used if a sheen is observed. The daily report is an internal Plant B record of operating parameters for the treatment plant. Sheens in the East Ditch were not observed during the October 2018 through March 2019 monitoring period.

3.1 Groundwater

The fourth quarter of 2018 sampling event included groundwater sample collection from monitoring wells: B-03, GW-13, GW-16R, GW-101, IW-6, and IW-10. The first quarter of 2019 sampling event included groundwater sample collection from monitoring well GW-16R. Groundwater samples were collected and analyzed for trimethylpentenes, n-nitrosodiphenylamine (NDPhA), bis(2-ethylhexyl)phthalate (BEHP), volatile petroleum hydrocarbons (VPH), ammonia, iron, and pH. QA/QC samples include one duplicate and one MS/MSD.

The fourth quarter of 2018 and first quarter of 2019 sample locations, details of sampling, and the analytical program are described in the field activity reports (**Appendices A-1 and A-2**, respectively). **Tables 3-2 and 3-3** present analytical results from the fourth quarter of 2018 and first quarter of 2019 groundwater sampling events, respectively. Data validation memoranda for these sampling events are included in **Appendix B** and indicate the analytical results are useable as reported by the laboratory unless otherwise indicated in the validation report.

The fourth quarter of 2018 and first quarter of 2019 analytical results for trimethylpentenes, NDPhA, BEHP, VPH, ammonia, iron, and pH in groundwater remain consistent with past results.

Olin personnel measure groundwater levels from 25 monitoring wells and three groundwater extraction wells (IW-11, IW-12, and IW-13) on a monthly frequency. If the water level probe suggests the presence of LNAPL, the thickness of the LNAPL is measured. The monthly water table elevation data are presented in **Tables 3-4 and 3-5** and in **Figures 3-1 through 3-6** during the October 2018 through March 2019 reporting period.

6107190016 | 7/3/2019 Page 6 of 1

3.2 Light Non-Aqueous Phase Liquid

The LNAPL layer in the vicinity of the Plant B treatment plant is not readily measurable by instrumentation. A protocol for LNAPL thickness measurement and visual confirmation of LNAPL was developed previously to address the interpretation of instrument response for what appears to be a very thin LNAPL layer at and below the meter sensitivity for detection (less than 0.01 feet). The LNAPL thickness measurement data for the reporting period are presented in **Figures 3-7 through 3-12**. LNAPL has been observed in both the observation wells and groundwater extractions wells. A layer of LNAPL has consistently been measured in wells GW-23, IW-11, and P5 with thin layers of LNAPL observed in wells 12-IN and IW-2.

The monthly LNAPL recovery data are presented in **Tables 3-4 and 3-5**. Over the reporting period, on average, approximately 0.02 gallons of LNAPL was recovered per month. The total LNAPL recovered for the October 2018 through March 2019 period was 0.1 gallons. Monthly and cumulative LNAPL recovery data are summarized in **Figure 3-13**. Groundwater levels relative to monthly LNAPL recovery are plotted and summarized in **Figure 3-14**.

The LNAPL recovery data indicate a stabilization of the LNAPL recovery rate since 2005 with all the recovered LNAPL coming from IW-11.

6107190016 | 7/3/2019 Page 7 of 1



4.0 DAPL EXTRACTION

This section reports progress on the DAPL Pilot Study and summarizes communication between Olin and USEPA for the reporting period (October 2018 through March 2019).

4.1 Operations Status

During the reporting period the extraction system operated at an extraction rate of approximately 0.25 gpm and was online from October 2018 through March 2019.

4.2 Reporting Status

Periodic data plots for pH, and specific conductance from multilevel wells (ML-1, ML-2, MP-2), the extraction well (EW-1) and induction logging results (ILW-1, and ILW-2) are sent directly to USEPA by Olin on an as requested basis.

6107190016 | 7/3/2019 Page 8 of 12



5.0 ADDITIONAL ACTIVITIES

During the reporting period for this SASR (fourth quarter of 2018 and first quarter 2019), Olin has completed or continued to progress on activities as described below. In addition, quarterly residential drinking water samples were collected from several residences in proximity of the Site.

Additional Remedial Investigation (RI) activities that were conducted are also described.

5.1 Major Submittals, Meetings and Other RI/FS Activities

The following major submittals and meeting occurred during the reporting period.

- On November 15, 2018 USEPA corresponded by letter denying proposed 2016 changes to optimize the IRSWP monitoring program but approved and expanded upon other proposed monitoring resulting in a request to conduct a comprehensive and expanded quarterly monitoring program in 2019.
- On November 30, 2018 Olin submitted a revised IRSWP addendum to modify the Plant B Continued OM&M Plan. USEPA responded to this request in a letter dated March 21, 2019.
- On December 10, 2018 Olin and USEPA met to discuss the Conceptual Site Model (CSM) for OU3.
- From December 18 to December 20, 2018 Olin and USEPA were on-site abandoning borehole OC-BB-2-2018 under a procedure that was an agreed upon November 19, 2019. A memorandum on the abandonment was submitted to USEPA on January 18, 2019.
- On January 2, 2019 Olin responded in writing to USEPA comments dated September 25, 2018 on the Draft OU3 RI report, the Draft OU3 BHHRA, the Draft OU1 & OU2 FS, the Draft OU3 FS, and reports on Containment Area Bedrock Borings and a Rock Matrix Sampling Work Plan.
- On January 3, 2019 Olin submitted SASR No. 23 to the USEPA.
- On January 21 Olin submitted a Draft updated Quality Assurance Project Plan for USEPA review.
- On March 8, 2019 USEPA responded to Olin's January 2, 2019 written response to comments.
- Olin and USEPA again held meetings on March 26, 2019 to discuss the CSM for OU3 following a February 20th conference call.

There were no additional major submittals specific to the OU3 RI/FS process during the reporting period.

5.2 Residential Drinking Water Sampling

The following paragraphs summarize water supply sampling activities at residential locations in accordance with methods in the approved RI/FS Work Plan, and as modified by the Summary Report for the 2010 Residential Drinking Water Program and the Phase I Private Well Sampling proposal.

Fourth quarter 2018 private well sampling was completed on December 6 and 7, 2018. Six residences: Map 2/Lot 7, Map 15/Lot 2C, Map 24/Lot 54, Map 24/Lot 63, Map 24/Lot 64, and Map 24/Lot 94 were sampled and analyzed for the following parameters: SVOCs, N-nitrosodimethylamine (NDMA), N-nitrosodin-propylamine (NDPrA), metals, hexavalent chromium, anions (chloride, sulfate, nitrate, nitrite), and ammonia. Two residences: Map 24/Lot 66, and Map 24/Lot 72 were sampled and analyzed for: NDMA, NDPrA, metals, anions, and ammonia. One residence: Map 14/Lot 2B was sampled and analyzed for: NDMA, NDPrA, metals, hexavalent chromium, anions, and ammonia. Six residences: Map 3/Lot 7, Map 1/Lot 6D, Map 1/Lot 6C, Map 3/Lot 2F, Map 3/Lot 2, and Map 3/Lot 2D were sampled and analyzed for NDMA only.

6107190016 | 7/3/2019 Page 9 of 1

Samples were not collected from locations: Map 24/Lot 65 and Map 27/Lot 14C because the well was shut off for the winter season. Samples were not collected at location Map 24/Lot 116 because access has not been granted.

First quarter 2019 private well sampling was completed on March 21-22, 2019 at the same residences and for the same analysis as listed during the December 2018 event (above) with the following exceptions: Samples were not collected from Map 24/Lot 72 because the property has been sold and the new owners have not granted access.

Location Map 3/Lot 7 was resampled in April 2019 for NDMA analysis only.

Data from the December 2018 and March2019 and April 2019 residential drinking water sampling events are summarized in **Tables 5-1 and 5-2**, respectively. The validation memoranda for the December 2018, March 2019 and April 2019 private well sampling event are attached in **Appendix B**.

5.3 Plant B Pumping Rate Reduction Test

The proposed Pumping Rate Reduction test is still officially on hold; however, some related monitoring activities were conducted in conjunction with temporary suspension of Plant B operations as described in Section 3.0.

5.4 OU1 and OU2 Remedial Investigation Sampling and Analytical Results

No additional OU1 and OU2 sampling activities have been completed during this reporting period. The OU1/ OU2 Draft Final Remedial Investigation Report was submitted to EPA on July 24, 2015 and was approved by USEPA.

5.5 OU3 Remedial Investigation Groundwater Sampling and Analytical Results

A full water level synoptic gauging event was completed in October 2018 following the March 2018 revised OU3 RI submittal. Results from this event will be included in a revised RI report.

A full OU3 comprehensive groundwater monitoring event was implemented between early March and early May 2019. Results from the OU3 comprehensive groundwater sampling event will be provided under separate cover.

Additional quarterly sampling for a subset of the comprehensive well list is scheduled for September and December 2019; however, monitoring wells located in Maple Meadow Brook will not be sampled until safety concerns are addressed.

5.6 Calcium Sulfate Landfill

Groundwater sampling at the Calcium Sulfate Landfill (CSL) has been completed consistent with the Massachusetts Department of Environmental Protection (MassDEP) approved semi-annual monitoring schedule (May and November). Groundwater samples were collected from select monitoring wells identified in **Figure 5-1**. Samples were collected and submitted by Olin personnel for the following analysis: total dissolved solids (TDS), total metals (calcium, sodium, aluminum, manganese, iron, chromium, and nickel), chloride, sulfate, and alkalinity. The data validation memorandum for the CSL groundwater monitoring program is attached in **Appendix B**. The CSL data (2019-2020) will be summarized and submitted to MassDEP in the 2020 biennial report.

6107190016 | 7/3/2019 Page 10 of 12

6.0 REFERENCES

AMEC Environnent & Infrastructure, Inc. (AMEC), 2012. Operations, Maintenance & Performance Monitoring Plan, DAPL Extraction Pilot Test for the Olin Chemical Superfund Site in Wilmington, MA, October 8, 2012.

MACTEC Engineering and Consulting, Inc. (MACTEC), 2008. Final Interim Response Steps Work Plan, Olin Chemical Superfund Site, Wilmington, Massachusetts. August 8, 2008.

6107190016 | 7/3/2019 Page 11 of 1



wood.

Tables

Table 2-1

Slurry Wall/Cap Analytical Results for Fourth Quarter 2018 Groundwater Sampling Semi-Annual Status Report No. 24 Olin Chemical Superfund Site Wilmington, Massachusetts

Parameter Name	OC-GW-10S 11/15/2018	OC-GW-201S 11/15/2018		OC-DUP-GW- 202D 11/14/2018	OC-GW-202S 11/14/2018	OC-GW-24 11/15/2018	OC-GW-25 11/15/2018	OC-GW-34D 11/15/2018	OC-GW-34SR 11/15/2018	OC-GW-35S 11/15/2018
Metals, Filtered (mg/L)										
Aluminum	5.2	0.088 J	0.82	0.81	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chromium	0.0015 J	0.048	0.21	0.21	0.0028 J	0.005 U	0.0044 J	0.012	0.0011 J	0.0056
Inorganics (mg/L)										
Nitrogen, as Ammonia	2.4	110	29 J	150 J	31	18	20	4.6	0.19 J	4.9
Chloride	44	95	240	250	160	77	330	3.1	1.4	1.7
Sulfate	88	1200	920	960	100	25	40	22	6.6	250
Specific Conductance (mS/cm)	0.35	3.0	2.8	2.8	0.97	0.56	1.3	0.12	0.083	0.081

Notes:

mg/L - milligrams per liter

mS/cm - milliSiemen per centimeter

U - analyte not detected,

value shown is detection limit

J - value is estimated

Table 2-1

Slurry Wall/Cap Analytical Results for Fourth Quarter 2018 Groundwater Sampling Semi-Annual Status Report No. 24 Olin Chemical Superfund Site Wilmington, Massachusetts

Parameter Name	OC-GW-42S (MP2 PORT 15) 11/28/2018	OC-GW-43SR 11/28/2018	OC-DUP-GW- 43SR 11/28/2018	OC-GW-76S 11/15/2018	OC-GW-78S 11/14/2018	OC-GW-79S 11/14/2018	OC-GW-CA-1 11/15/2018	OC-PZ16RRR 11/14/2018
Metals, Filtered (mg/L)								
Aluminum	0.53	0.19 J	0.17 J	0.34	0.2 U	0.2 U	0.2 U	0.2 U
Chromium	0.064	0.0013 J	0.0014 J	0.0025 J	0.0023 J	0.0056	0.0088	0.009
Inorganics (mg/L)								
Nitrogen, as Ammonia	1.4	0.78 J	0.83	6.1	33	51	0.54	100
Chloride	230	230	230	37	8.4	100	14	160
Sulfate	9.4	24	24	27	460	540	85	780
Specific Conductance (mS/cm)	0.91	0.93	0.94	0.24	1.4	1.7	0.67	2.4

Notes:

mg/L - milligrams per liter

mS/cm - milliSiemen per centimeter

U - analyte not detected,

value shown is detection limit

J - value is estimated

Table 2-1 Slurry Wall/Cap Analytical Results for Fourth Quarter 2018 Groundwater Sampling Semi-Annual Status Report No. 24 Olin Chemical Superfund Site Wilmington, Massachusetts

Parameter Name	OC-PZ17RRR 11/14/2018	OC-PZ18R 11/14/2018	OC-PZ-24 11/15/2018	OC-PZ-25 11/15/2018
Metals, Filtered (mg/L)				
Aluminum	0.2 U	0.2 U	0.2 U	0.2 U
Chromium	0.0063	0.032	0.037	0.0098
Inorganics (mg/L)				
Nitrogen, as Ammonia	30	160	35	10 U
Chloride	13	500	7.2	15
Sulfate	310	1100	790	360
Specific Conductance (mS/cm)	1.0	3.7	1.9	1.2

Prepared by: KMS 6/18/19

Checked by: CTM 6/25/19

Notes:

mg/L - milligrams per liter

mS/cm - milliSiemen per centimeter

U - analyte not detected,

value shown is detection limit

J - value is estimated

\\WFD-FS1\projectf\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2019 July\Tables\
4Q18 to 1Q19 tables.xlsx, 2-1_4Q18 GW SWC

Table 2-2

Slurry Wall/Cap Analytical Results for First Quarter 2019 Groundwater Sampling Semi-Annual Status Report No. 24 Olin Chemical Superfund Site Wilmington, Massachusetts

	OC-GW-202D 4/3/2019	OC-GW-202S 4/3/2019	OC-GW-25 4/4/2019	OC-GW-78S 4/3/2019	OC-GW-79S 4/4/2019	OC-PZ-16RRR 4/4/2019	OC-PZ-17RRR 4/3/2019	OC-PZ-18R 4/3/2019	OC-PZ-24 4/3/2019	OC-PZ-25 4/3/2019
Parameter Name										
Metals, Filtered (mg/L)										
Aluminum	0.85	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chromium	0.20	0.0038 J	0.0044 J	0.0048 J	0.004 J	0.0071	0.0075	0.048	0.021	0.015
Inorganics (mg/L)										
Nitrogen, as Ammonia	110	31	14	24	61	90	28	200	25	28
Chloride	140	110	300	8.2	160	130	11	580	7.4	21
Sulfate	860	170	44	440	800	530	440	1200	760	430
Specific Conductance (mS/cm)	2.4	1.0	1.3	1.4	2.1	1.8	1.4	3.9	1.8	1.4

Notes:

mg/L - milligrams per liter

mS/cm - milliSiemen per centimeter

U - analyte not detected,

value shown is detection limit J - value is estimated

Prepared by: KMS 6/18/19

Checked by: CTM 6/25/19

Table 2-3 Slurry Wall/Cap Analytical Results for Fourth Quarter 2018 Surface Water Sampling Semi-Annual Status Report No. 24 Olin Chemical Superfund Site Wilmington, Massachusetts

	OC-ISCO1	OC-ISCO2	OC-PZ-16RRRSW	OC-PZ-17RRRSW	OC-PZ-18RSW	OC-DUP-PZ-18RSW	OC-SD-17
	12/4/2018	12/4/2018	12/4/2018	12/4/2018	12/4/2018	12/4/2018	12/4/2018
Parameter Name							
Metals, Total (mg/L)							
Aluminum	0.19 J	0.69	0.39	0.29	0.22	0.20	0.27
Chromium	0.0091	0.021	0.022	0.027	0.0095	0.009	0.026 J
Sodium	85	66	81	85	88	87	86
Metals, Filtered (mg/L)							
Aluminum	0.17 J	0.32	0.30	0.23	0.18 J	0.16 J	0.33
Chromium	0.0084	0.013	0.018	0.023	0.0082	0.0077	0.04 J
Sodium	93	71	86	92	92	87	90
Inorganics (mg/L)							
Nitrogen, as Ammonia	9.0	11	14	13	7.5	8.7	11
Chloride	150	110	130	140	150	150	140
Nitrate as N	0.30	0.41	0.34	0.29	0.30	0.32	0.30
Nitrite as N	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U

90

0.75

81

0.75

50

0.70

52

0.71

Notes:

Sulfate

mg/L - milligrams per liter

mS/cm - milliSiemen per centimeter

50

0.71

98

0.67

U - not detected,

value is the detection limit

Specific Conductance (mS/cm)

J - value is estimated

Prepared by: KMS 6/18/19 Checked by: CTM 6/25/19

81

0.75

Table 2-4 Slurry Wall/Cap Analytical Results for First Quarter 2019 Surface Water Sampling Semi-Annual Status Report No. 24 Olin Chemical Superfund Site Wilmington, Massachusetts

	OC- ISCO1	OC- ISCO2	OC- ISCO3	OC-PZ-16RRRSW	OC-PZ-17RRRSW	OC-PZ-18RSW	OC-SD-17
	4/2/2019	4/2/2019	4/2/2019	4/2/2019	4/2/2019	4/2/2019	4/2/2019
Parameter Name							
Metals, Total (mg/L)							
Aluminum	0.11 J	0.43	0.2 U	0.26	0.12 J	0.096 J	0.11 J
Sodium	120	94	140	120	120	130	120
Chromium	0.0091	0.022	0.005 U	0.018	0.022	0.0088	0.023 J
Metals, Filtered (mg/L)							
Aluminum	0.094 J	0.14 J	0.2 U	0.071 J	0.16 J	0.083 J	0.53 J
Sodium	130	98	140	120	130	120	130
Chromium	0.0075	0.0084	0.005 U	0.0099	0.019	0.0051	0.089 J
Inorganics (mg/L)							
Chloride	210	150	290	180	200	220	200
Nitrate as N	0.44	0.64	0.99	0.54	0.45	0.44	0.45
Nitrite as N	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Nitrogen, as Ammonia	11	16	0.73	20	22	12	14
Specific Conductance (mS/cm)	1.0	0.99	1.2	1.1	1.2	1.0	1.2
Sulfate	68	140	25	150	140	66	140

Notes:

mg/L - milligrams per liter

mS/cm - milliSiemen per centimeter

U - not detected,

value is the detection limit

J - value is estimated

Prepared by: KMS 6/20/19 Checked by: CTM 6/25/19

Table 2-5 Slurry Wall/Cap Analytical Results for Fourth Quarter 2018 Sediment Sampling Semi-Annual Status Report No. 24 Olin Chemical Superfund Site

Wilmington, Massachusetts

Parameter Name	OC-SD1 12/4/2018	OC-SD2 12/4/2018	OC-SD3 12/4/2018	OC-SD4 12/4/2018	OC-SD5 12/4/2018	OC-SD5-DUP 12/4/2018
Metals, Total (mg/kg)						
Aluminum	7400 J	18000	16000	8500	11000	9900
Chromium	15	1800	1100	28	360 J	130 J
Iron	7600 J	14000	13000	10000	13000	17000
Inorganics (mg/kg)						
Percent Moisture	71.4	42.8	49.9	69.5	56.5	69.4
Percent Solids	28.6	57.2	50.1	30.5	43.5	30.6

Notes: mg/kg - milligrams per kilogram

J - value is estimated

Prepared by: KMS 6/18/19

Checked by: CTM 6/25/19

Table 3-1 Plant B Analytical Results for RGP Sampling (October 2018 - March 2019) Semi-Annual Status Report No. 24 Olin Chemical Superfund Site Wilmington, Massachusetts

	Plant B Influent	Plant B Influent	Plant B Influent	Plant B Influent	Plant B Influent	Plant B Influent	Plant B Influent	IDW	IDW	IDW	IDW	IDW	IDW	IDW	IDW	IDW
	OC-INF-112818	OC-INF-120618	OC-INF-121418	OC-INF-122018	OC-INF-122718	OC- INF-010319	OC-INF- 010919	OC-Inf- 021219	OC-INF030719	OC-T11-112018	OC-T5-120418	OC-T4-120518	OC-T10-120618	OC-T3-120618	OC-T11-121118	OC-T3-122018
	11/28/2018	12/6/2018	12/14/2018	12/20/2018	12/27/2018	1/3/2019	1/9/2019	2/12/2019	3/7/2019	11/20/2018	12/4/2018	12/5/2018	12/6/2018	12/6/2018	12/11/2018	12/20/2018
Parameter Name																
VOCs (mg/L)																
1,2-Dichlorobenzene	0.00023 J	0.001 U	0.001 U	0.0002 J	0.00012 J	0.00033 J	0.00025 J	0.001 U	0.00025 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloroethane	0.001 U	0.001 U	0.001 U	0.00016 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,4-Dichlorobenzene	0.00015 J	0.001 U	0.001 U	0.001 U	0.00014 J	0.001 U	0.00019 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
2,4,4-Trimethyl-1-pentene	0.16 E	0.34 *	0.25 *	0.28	0.26 *	0.17	0.19	0.23	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U *	0.001 U
2,4,4-Trimethyl-2-pentene	0.07	0.13 *	0.08	0.1	0.1 *	0.062	0.078	0.1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U *	0.001 U
Acetone	0.0078	0.0048 J	0.05 U	0.025 U	0.0066	0.05 U	0.05 U	0.05 U	0.005 U	0.0022 J *	0.0012 J	0.0035 J *	0.0013 J	0.0011 J	0.005 U	0.0019 J
Ethylbenzene	0.001 U	0.00022 J	0.00016 J	0.001 U	0.00018 J	0.00023 J	0.00014 J	0.0002 J	0.00013 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	0.003	0.00017 J B	0.001 U	0.001 U	0.001 U	0.001 U	0.00011 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Phenolics, Total Recoverable	0.0074 J	0.01	0.015	0.017	0.0067 J	0.01 U	0.011	0.0098	0.012	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.0086 J F1
SVOCs (mg/L)																
3 & 4 Methylphenol	0.0055 J	0.1 U	0.1 U	0.01 U	0.1 U	0.01 U	0.01 U	0.0095 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
3-Methylphenol	0.0055 J	0.1 U	0.1 U	0.01 U	0.1 U	0.01 U	0.01 U	0.0095 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
4-Methylphenol	0.0055	0.05 U	0.05 U	0.005 U	0.05 U	0.005 U	0.005 U	0.0048 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Benzo(a)anthracene	0.005 U	0.05 U	0.05 U	0.005 U	0.05 U	0.005 U	0.005 U	0.0048 U	0.005 U	0.005 U	0.005 U *	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Benzo(a)pyrene	0.005 U	0.05 U	0.05 U	0.005 U	0.05 U	0.005 U *	0.005 U	0.0048 U	0.005 U *	0.005 U	0.005 U *	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Benzo(b)fluoranthene	0.005 U	0.05 U	0.05 U	0.005 U	0.05 U	0.005 U	0.005 U	0.0048 U	0.005 U	0.005 U	0.005 U *	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Benzo(k)fluoranthene	0.005 U	0.05 U	0.05 U	0.005 U *	0.05 U	0.005 U	0.005 U	0.0048 U	0.005 U	0.005 U *	0.005 U *	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U *
Bis(2-Chloroethyl)ether	0.00003 U	0.00003 U	0.00003 U	0.00003 U	0.00003 U	0.00003 U	0.00003 U *	0.00003 U	0.00003 U	0.00003 U	0.00003 U	0.00003 U	0.00003 U	0.00003 U	0.00003 U	0.00003 U
Bis(2-Ethylhexyl)phthalate	0.34	0.1 U	0.1 U	0.0028 J	0.1 U	0.096	0.091	0.0075 J	0.0025 J B	0.01 U	0.01 U *	0.01 U	0.01 U	0.002 J	0.01 U	0.01 U
Chrysene	0.005 U	0.05 U	0.05 U	0.005 U *	0.05 U	0.005 U	0.005 U	0.0048 U	0.005 U	0.005 U	0.005 U *	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U *
Dibenz(a,h)anthracene	0.005 U *	0.05 U	0.05 U	0.005 U *	0.05 U	0.005 U	0.005 U	0.0048 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U *
Hexachlorobenzene	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U
Indeno(1,2,3-cd)pyrene	0.005 U *	0.05 U	0.05 U	0.005 U	0.05 U	0.005 U	0.005 U	0.0048 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
N-Nitrosodimethylamine	0.01 U	0.1 U *	0.1 U *	0.01 U	0.1 U	0.01 U	0.01 U	0.0095 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U *	0.01 U *	0.01 U	0.01 U
Pentachlorophenol	0.01 U *	0.1 U	0.1 U	0.01 U *	0.1 U	0.01 U	0.01 U	0.0095 U	0.01 U	0.01 U	0.01 U *	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U *
Phenol	0.0017 J	0.015 J	0.05 U	0.034	0.05 U	0.03	0.034	0.0048 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Total Metals (mg/L)																
Antimony	0.003 U	0.003 U	0.003 U	0.0017 J	0.0052	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U
Arsenic	0.022	0.011	0.0098	0.0075 B	0.0077 B	0.0099	0.01	0.012	0.0067	0.00088 J	0.0012 B	0.00042 J	0.00069 J	0.00063 J	0.00084 J	0.001 B
Cadmium	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.00022 J	0.0005 U
Chromium, Hexavalent	0.0006 U F1	0.0003 U	0.0015 U H	0.0003 U H	0.0003 U	0.0003 U	0.0003 U	0.0003 U F1	0.0003 U F1		0.0003 J B	0.0003 U	0.00017 J B	0.0003 U	0.0003 U	0.0003 U H
Chromium, Trivalent	0.005 U	0.024	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.025	0.026	0.032	0.005 U	0.005 U				
Copper	0.0067	0.013	0.0077 B	0.0048	0.002	0.0038	0.0027	0.00078 J	0.001 J	0.002 U	0.00065 J	0.0061	0.0083	0.0099	0.0071 B	0.002 U
Iron	20 0.0012	6.2 V 0.00026 J	6.2 0.0005 U	4.7 0.00059	4.9 0.00037 J	8.7 0.0005 U	8.4 0.0005 U	0.0005 U	4.6 0.0005 U	0.1 U 0.0016	0.1 U 0.0005 U	0.096 J 0.00021 J	0.1 U 0.00018 J	0.092 J 0.00031 J	0.056 J 0.00033 J	0.066 J 0.0005 U
Lead																
Mercury	0.0002 U	0.0002 U	0.00027	0.0002 U ^	0.0002 U	0.0002 U	0.0002 U	0.0002 U ^	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U ^
Nickel	0.0031	0.0027	0.0013 J	0.0029	0.002 U	0.0024	0.002	0.002 U	0.001 J	0.0019 J	0.002 U	0.0031	0.0027	0.0029	0.0013 J	0.0011 J
Silver	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U 0.02 U	0.00068	0.0005 U
Zinc	0.022 B	0.011 J	0.02 U	0.035	0.021	0.012 J	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 0	0.02 U	0.02 U
Oil and Grease (mg/L)	E11*	FOLI	5.1 U	5.2 U *	6 E E 1 D	4410	4.9 U	4.9 U	5.1 U	E 2 11 F 4	E 2	E 0 1 1	5.1 U	5.1 U	4.7 U	E 2
Total Petroleum Hydrocarbons	5 U *	5.2 U	5.1 U	5.∠ U ″	6.5 F1 B	4.4 J B	4.9 U	4.9 U	5.1 U	5.3 U F1	5.3 U F1 *	5.2 U	5.1 U	5.1 U	4./ U	5.3 U F1 *
Inorganic Compounds (mg/L)	00	75	100	110	00	16	4	140	100	200	200	200	100	150	170	100
Chloride	23	75	120	110	90	16	1 0 4 1 1 1 1 5	140	120	220	220	200	180	150	170	120
Chlorine	0.02 U HF	0.02 U HF	0.02 HF	0.02 HF	0.02 U HF	0.02 HF	0.4 U HF	0.4 U HF	0.4 U HF	0.02 U HF	0.02 U HF	0.02 U HF	0.01 J HF	0.02 U HF	0.02 U HF	0.01 J HF 3.5
Nitrogen, as ammonia Sulfate	7.4 B 58	6.6 B 54 B	5.7 53	7.1 53 B	2.1 B	9.5 B	11	3.5 44	10 50	0.32 B 54	0.21 F1 56	1 B 37	1.2 B 32 B	1.8 B 27 B	1.2 43 B	
	9.2				32 5.6	59	5.4		50 5							39 B
Total Suspended Solids	9.2	8.8	12	11	მ.ნ	12	16	12	5	4 U	4 U	4 U	4 U	4 U	4 U	4 U

Notes: mg/L - milligrams per liter U - analyte not detected, value shown is detection limit

J - value is estimated
B - Compound was found in the blank and sample
* - LCS or LCSD exceeds the

control limits

E - Exceeded the calibration

range

Table 3-1 Plant B Analytical Results for RGP Sampling (October 2018 - March 2019) Semi-Annual Status Report No. 24 Olin Chemical Superfund Site Wilmington, Massachusetts

	IDM	IDW	IDW	IDW	IDW	IDW	IDW	IDW	IDW	IDW	IDW	IDW	IDW	IDW	IDW
	IDW	IDW	IDW	IDW	IDW	IDW	IDW	IDW	IDW	IDW	IDW	IDW	IDW	IDW	IDW
	OC-T4-122618					OC-T10-012919		OC-T4-013119 1/31/2019	OC-T II- 021219	2/14/2019	OC-T3-030719 3/7/2019	OC-T10 - 031919 3/19/2019	3/20/2019	OC-T3-032519 3/25/2019	
Davamatau Nama	12/26/2018	12/27/2018	1/3/2019	1/7/2019	1/24/2019	1/29/2019	1/29/2019	1/31/2019	2/12/2019	2/14/2019	3/7/2019	3/19/2019	3/20/2019	3/25/2019	3/25/2019
Parameter Name															
VOCs (mg/L)	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichlorobenzene	0.001 U					0.001 U						0.001 U			
1,2-Dichloroethane		0.001 U 0.001 U	0.001 U	0.001 U	0.001 U		0.001 U	0.001 U	0.001 U 0.001 U	0.001 U	0.001 U		0.001 U	0.001 U 0.001 U	0.001 U
1,4-Dichlorobenzene	0.001 U 0.001 U *	0.001 U *	0.001 U 0.001 U	0.001 U 0.001 U *	0.001 U 0.001 U	0.001 U 0.001 U	0.001 U 0.001 U	0.001 U 0.001 U	0.001 U	0.001 U 0.001 U	0.001 U 0.25	0.001 U 0.001 U	0.001 U 0.001 U	0.001 U	0.001 U 0.001 U
2,4,4-Trimethyl-1-pentene	0.001 U *	0.001 U *			0.001 U		0.001 U	0.001 U *	0.001 U	0.001 U	0.25		0.001 U	0.001 U	0.001 U
2,4,4-Trimethyl-2-pentene Acetone	0.001 U	0.001 J	0.001 U 0.0011 J	0.001 U * 0.005 U	0.001 U	0.001 U 0.005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0041 J	0.001 U 0.005 U	0.001 U	0.001 J	0.001 U
	0.005 U 0.001 U					0.005 U 0.001 U					0.0041 J 0.001 U	0.005 U 0.001 U			
Ethylbenzene		0.001 U 0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U 0.001 U	0.001 U 0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U 0.001 U	0.001 U
Toluene	0.001 U		0.001 U	0.001 U	0.001 U		0.001 U			0.001 U			0.001 U		0.001 U
Phenolics, Total Recoverable	0.01 U	0.01 U	0.01 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SVOCs (mg/L)	0.04.11	0.01 U	0.04.11	0.04.11.11	0.044.11	0.000711	0.0096 U	0.0005.11	0.000011	0.000711	0.04.11	0.04.11	0.04.11	0.0005.11	0.000511
3 & 4 Methylphenol	0.01 U		0.01 U	0.01 U H	0.011 U	0.0097 U		0.0095 U	0.0096 U	0.0097 U	0.01 U	0.01 U	0.01 U	0.0095 U	0.0095 U
3-Methylphenol	0.01 U	0.01 U	0.01 U	0.01 U H	0.011 U	0.0097 U	0.0096 U	0.0095 U	0.0096 U	0.0097 U	0.01 U	0.01 U	0.01 U	0.0095 U	0.0095 U
4-Methylphenol	0.005 U	0.005 U	0.005 U	0.005 U H	0.0053 U	0.0049 U	0.0048 U	0.0048 U	0.0048 U	0.0049 U	0.005 U	0.005 U	0.005 U	0.0048 U	0.0048 U
Benzo(a)anthracene	0.005 U	0.005 U	0.005 U	0.005 U H	0.0053 U	0.0049 U	0.0048 U	0.0048 U	0.0048 U	0.0049 U	0.005 U	0.005 U	0.005 U	0.0048 U	0.0048 U
Benzo(a)pyrene	0.005 U	0.005 U	0.005 U *	0.005 U H	0.0053 U	0.0049 U	0.0048 U 0.0048 U	0.0048 U	0.0048 U	0.0049 U	0.005 U *	0.005 U	0.005 U	0.0048 U	0.0048 U
Benzo(b)fluoranthene	0.005 U	0.005 U	0.005 U	0.005 U	0.0053 U	0.0049 U		0.0048 U	0.0048 U	0.0049 U	0.005 U	0.005 U	0.005 U	0.0048 U	0.0048 U
Benzo(k)fluoranthene	0.005 U	0.005 U	0.005 U	0.005 U	0.0053 U	0.0049 U	0.0048 U	0.0048 U	0.0048 U	0.0049 U	0.005 U	0.005 U	0.005 U	0.0048 U	0.0048 U
Bis(2-Chloroethyl)ether	0.00003 U	0.00003 U	0.00003 U	0.00003 U	0.00003 U	0.00003 U	0.00003 U	0.00003 U	0.00003 U	0.00003 U	0.00003 U	0.00003 U	0.00003 U	0.00003 U	0.00005
Bis(2-Ethylhexyl)phthalate	0.01 U	0.0012 J	0.01 U	0.01 U	0.0064 J	0.0097 U	0.0096 U	0.0095 U	0.0096 U	0.0097 U	0.002 J B	0.01 U	0.01 U	0.0095 U	0.0095 U
Chrysene	0.005 U	0.005 U	0.005 U	0.005 U	0.0053 U	0.0049 U	0.0048 U	0.0048 U	0.0048 U	0.0049 U	0.005 U	0.005 U *	0.005 U *	0.0048 U	0.0048 U
Dibenz(a,h)anthracene	0.005 U	0.005 U	0.005 U	0.005 U	0.0053 U	0.0049 U	0.0048 U	0.0048 U	0.0048 U	0.0049 U	0.005 U	0.005 U	0.005 U	0.0048 U	0.0048 U
Hexachlorobenzene	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 J	0.00011
Indeno(1,2,3-cd)pyrene	0.005 U	0.005 U	0.005 U	0.005 U *	0.0053 U	0.0049 U	0.0048 U	0.0048 U	0.0048 U	0.0049 U	0.005 U	0.005 U	0.005 U	0.0048 U	0.0048 U
N-Nitrosodimethylamine	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.0097 U	0.0096 U	0.0095 U	0.0096 U	0.0097 U	0.01 U	0.01 U *	0.01 U *	0.0095 U	0.0095 U
Pentachlorophenol	0.01 U *	0.01 U	0.01 U	0.01 U	0.011 U	0.0097 U	0.0096 U	0.0095 U	0.0096 U	0.0097 U	0.01 U	0.01 U	0.01 U *	0.0095 U	0.0095 U
Phenol	0.005 U	0.005 U	0.005 U	0.005 U	0.0053 U	0.0049 U	0.0048 U	0.0048 U	0.0048 U	0.0049 U	0.0029 J	0.005 U	0.005 U	0.0048 U	0.0048 U
Total Metals (mg/L)	0.00011	0.00011	0.00011	0.000.11	0.00011	0.00011	0.00011	0.000.11	0.00011	0.00011	0.00011	0.00011	0.000.11	0.00011	0.00011
Antimony	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U
Arsenic	0.0007 J B	0.0012 B	0.0014	0.0018	0.001	0.0015	0.0015	0.0012	0.002	0.0019	0.0011	0.0025	0.0022 B	0.0018 B	0.0026 B
Cadmium	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
Chromium, Hexavalent	0.00014 J B	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U H	0.00028 J H	0.00026 J H	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U
Chromium, Trivalent	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Copper	0.0017 J	0.00086 J	0.002 U	0.0012 J	0.002 U	0.002 U	0.0019 J	0.002 U	0.002 U	0.002 U	0.0014 J	0.00074 J	0.002 U	0.002 U	0.002 U
Iron	0.11	0.1 U	0.1 U	0.1 U	0.17	0.1 U	0.04 J	0.19	0.1 U	0.1 U	0.25	0.1 U	0.1 U	0.13 B	0.19 B
Lead	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
Mercury	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U ^	0.0002 U	0.0002 U	0.0002 U	0.0002 U ^	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Nickel	0.001 J	0.002 U	0.002 U	0.002 U	0.0012 J	0.002 U	0.002 U	0.002 U	0.002 U	0.0013 J	0.0012 J	0.00095 J	0.002 U	0.0013 J	0.0014 J
Silver	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
Zinc	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.0098 J	0.02 U	0.02 U	0.02 U
Oil and Grease (mg/L)	0.0.1	5011	07.154.5	5011	4011	F.1.	4011	E 4 11	5411	F.11	4.0.11	4.0.11	F.11	4011	1011
Total Petroleum Hydrocarbons	2.6 J	5.2 U	2.7 J F1 B	5.2 U	4.8 U	5 U	4.8 U	5.1 U	5.1 U	5 U	4.8 U	4.8 U	5 U	4.8 U	4.8 U
Inorganic Compounds (mg/L)	400	100	400	100	440	440	440	07.54	400	400	440	450	100	440	100
Chloride	130	120	120	130	110	110	110	87 F1	130	120	140	150	130	140	130
Chlorine	0.02 HF	0.01 J HF	0.01 J HF	0.4 U HF	0.4 U HF	0.4 U HF	0.4 U HF	0.4 U HF	0.4 U HF	0.4 U HF	0.4 U HF	0.4 U HF	0.4 U HF	0.4 U HF	0.4 U HF
Nitrogen, as ammonia	3.3 B	3 B	1.5 B	0.065 J	0.072 J	0.77	0.37	0.22	0.08 J	0.28	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Sulfate	43	41	44	34	43	44	43	43	46	37	44	48	49	42	43
Total Suspended Solids	4 U	4 U	4 U	1 U	1.4	1 U	1 U	1.1 U	1.1 U	1 U	1.2	1 U	10 U	2.5 U	2.6 U

Notes: mg/L - milligrams per liter U - analyte not detected, value shown is detection limit

J - value is estimated
B - Compound was found in the blank and sample
* - LCS or LCSD exceeds the

control limits

E - Exceeded the calibration

range

Prepared by: KMS 6/18/19 Checked by: CTM 6/25/19

Table 3-2 Plant B Analytical Results for Fourth Quarter 2018 Groundwater Sampling Semi-Annual Status Report No. 24 Olin Chemical Superfund Site Wilmington, Massachusetts

	B-03 OC-B-03 11/28/2018	GW-101 OC-GW-101 11/27/2018	GW-13 OC-GW-13 11/28/2018	GW-16R OC-GW-16R 11/28/2018	GW-16R OC-DUP GW 16R 11/28/2018	IW-10 OC-IW-10 11/27/2018	IW-6 OC-IW-6 11/27/2018
Parameter Name							
Volatile Organics (mg/L)							
2,4,4-Trimethyl-1-pentene	0.001 U	0.63	0.0011	1.7 J	1.5 J	0.0055	0.45
2,4,4-Trimethyl-2-pentene	0.001 U	0.23	0.001 U	0.67	0.59	0.0064	0.093
Semivolatile Organics (mg/L)							
Bis(2-Ethylhexyl)phthalate	0.026 U	0.025 U	0.00055 J	0.053 U	0.1 U	0.05 U	0.00064 J
N-Nitrosodiphenylamine	0.00043 J	0.85	0.0053 U	0.053 J	0.13 J	0.05 U	0.00028 J
Metals, Filtered (mg/L)							
Iron	0.31	4.6	0.074	2.0	2.1	0.29	28
Inorganics (mg/L)							
Nitrogen, as Ammonia	0.27 U	1.6 J	0.21 U	3.4	3.6	37	1.2 U
рН	5.8 J	7.1 J	5.6 J	6.7 J	6.7 J	7.4 J	6.5 J
Extractable Petroleum Hydroca	rbons (mg/L)						
Benzo(ghi)perylene		0.0028 J				0.0098 J	0.0042 J
Indeno(1,2,3-cd)pyrene		0.01 U				0.003 J	0.01 U
Dibenz(a,h)anthracene		0.01 U				0.0058 J	0.0034 J
C11-C22 Aromatics Adjusted		0.78				0.54	0.05 U
C11-C22 Aromatics (unadj.)		0.79				0.56	0.038 JB
Volatile Petroleum Hydrocarbor	ns (mg/L)						
Toluene	0.001 U	0.0028 J	0.001 U	0.05 U	0.05 U	0.001 U	0.01 U
Xylene, o	0.001 U	0.019	0.00028 J	0.019 J	0.02 J	0.00062 J	0.0078 J
C9-C12 Aliphatics	0.0026 J	0.048 J	0.005 U	0.25 U	0.25 U	0.005 U	0.18
C5-C8 Aliphatics	0.0092	1.1	0.019	2.3	2.3	0.032	0.42
C5-C8 Aliphatics (unadj.)	0.0092	1.1	0.019	2.3	2.3	0.032	0.42
C9-C10 Aromatics (unadj.)	0.0018 J	0.017 J	0.005 U	0.25 U	0.25 U	0.002 J	0.05 U
C9-C12 Aliphatics (unadj.)	0.0043 J	0.085 J	0.005 U	0.25 U	0.25 U	0.0045 J	0.19

Notes:

mg/L - milligrams per liter U - analyte not detected,

value shown is reporting limit

J - value is estimated

Prepared by: KMS 6/18/19 Checked by: CTM 6/25/19

Table 3-3 Plant B Analytical Results for First Quarter 2019 Groundwater Sampling Semi-Annual Status Report No. 24 Olin Chemical Superfund Site Wilmington, Massachusetts

	GW-16R OC-GW-16R 3/30/2017
Parameter Name	
Volatile Organics (mg/L)	1.4
2,4,4-Trimethyl-1-pentene	
2,4,4-Trimethyl-2-pentene	0.45
Semivolatile Organics (mg/L) N-Nitrosodiphenylamine	0.14
Metals, Filtered (mg/L)	0.14
Iron	2.1
Inorganics (mg/L)	2.1
Nitrogen, as Ammonia	3.7
pH	7.0 J
Volatile Petroleum Hydrocarbons (mg/L) Toluene Xylene, o	0.0036 J 0.017 J
C9-C12 Aliphatics	0.49 J
C5-C8 Aliphatics	2.0
C5-C8 Aliphatics (unadj.)	2.0
C9-C10 Aromatics (unadj.)	0.013 J
C9-C12 Aliphatics (unadj.)	0.52 J
Notes: mg/L - milligrams per liter U - analyte not detected, value shown is reporting limit B - Compound was found in the blank and sample J - value is estimated	Prepared by: KMS 6/18/19 Checked by: CTM 6/25/19

Table 3-4

Plant B Water Level and Product Recovery Data: October 2018 - December 2018

Semi-Annual Status Report No. 24

Olin Chemical Superfund Site

Wilmington, Massachusetts

Well	[Depth to Water feet ²		D	epth to Produc	et	Pı	oduct Thicknes	ss	Reference Elevation	Potentiometric Surface Elevation (feet NGVD) Corrected for Product 5			Pı	oduct Remove gallons	ed
ID	10/30/2018	11/27/2018	12/27/2018	10/30/2018	11/27/2018	12/27/2018	10/30/2018	11/27/2018	12/27/2018	feet	10/30/2018	11/27/2018	12/27/2018	10/30/2018	11/27/2018	12/27/2018
B-2	11.45	10.28	10.26	NPD	NPD	NPD	NA	NA	NA	90.48	79.03	80.20	80.22			
B-3	10.83	9.57	9.55	NPD	NPD	NPD	NA	NA	NA	90.32	79.49	80.75	80.77			
B-5R	11.17	9.21	9.23	NPD	NPD	NPD	NA	NA	NA	91.38	80.21	82.17	82.15			
B-7A	7.86	6.01	6.02	NPD	NPD	NPD	NA	NA	NA	88.81	80.95	82.80	82.79			
B-17	9.51	7.31	7.33	NPD	NPD	NPD	NA	NA	NA	91.55	82.04	84.24	84.22			
GW-13	11.24	10.37	10.36	NPD	NPD	NPD	NA	NA	NA	90.57	79.33	80.20	80.21			
GW-14	9.13	6.53	6.56	NPD	NPD	NPD	NA	NA	NA	88.70	79.57	82.17	82.14			
GW-15	8.81	5.83	5.81	NPD	NPD	NPD	NA	NA	NA	90.01	81.20	84.18	84.20			
GW-16R	10.89	8.61	8.58	NPD	NPD	NPD	NA	NA	NA	92.46	81.57	83.85	83.88			
GW-23	12.31	11.26	11.28	12.05	11.23	11.24	0.26	0.03	0.04	91.04	78.98	79.81	79.80			
GW-52S	8.78	5.83	5.84	NPD	NPD	NPD	NA	NA	NA	87.95	79.17	82.12	82.11			
GW-100	11.15	10.56	10.58	NPD	NPD	NPD	NA	NA	NA	90.15	79.00	79.59	79.57			
GW-101	11.13	10.48	10.49	NPD	NPD	NPD	NA	NA	NA	90.14	79.01	79.66	79.65			
GW-102	9.98	9.28	9.31	NPD	NPD	NPD	NA	NA	NA	89.00	79.02	79.72	79.69			
IW-1	11.19	10.03	10.04	NPD	NPD	NPD	NA	NA	NA	90.71	79.52	80.68	80.67			
IW-2	11.39	10.40	10.43	11.37	NPD	NPD	0.02	NA	NA	90.53	79.16	80.13	80.10			
IW-3	11.35	10.55	10.57	NPD	10.54	NPD	NA	0.01	NA	90.76	79.41	80.22	80.19			
IW-6	10.35	9.81	9.83	NPD	NPD	NPD	NA	NA	NA	89.15	78.80	79.34	79.32			
IW-7	11.04	10.44	10.45	NPD	NPD	NPD	NA	NA	NA	90.10	79.06	79.66	79.65			
IW-8	10.85	10.18	10.17	NPD	10.17	NPD	NA	0.01	NA	89.94	79.09	79.77	79.77			
IW-9	10.63	9.87	9.89	NPD	NPD	NPD	NA	NA	NA	89.78	79.15	79.91	79.89			
IW-10	11.30	10.41	10.42	NPD	NPD	NPD	NA	NA	NA	90.43	79.13	80.02	80.01			
IW-11	10.83	10.11	11.22	NPD	10.09	11.19	NA	0.02	0.03	89.92	79.09	79.83	78.73			
IW-12	11.31	10.69	11.22	NPD	NPD	NPD	NA	NA	NA	90.31	79.00	79.62	79.09			
IW-13	10.70	9.87	13.74	NPD	NPD	13.73	NA	NA	0.01	89.90	79.20	80.03	76.17			
PID	10.90	10.20	10.88	NPD	NPD	NPD	NA	NA	NA	89.97	79.07	79.77	79.09			
P5	11.26	11.77	11.25	11.25	11.75	11.24	0.01	0.02	0.01	90.45	79.20	78.70	79.21			
12-IN	10.45	9.66	9.67	NPD	9.66	9.67	NA	Trace	Trace	89.84	79.39	80.18	80.17			
	Recovered Product For Month							Month	0.04	0.00	0.00					

Notes:

NPD - No Product Detected; NA - Not Applicable;

1 - Groundwater measurements and product recovery data collected by Olin

2 - Measurement collected from top of PVC; if well does not have PVC casing, measurement taken from top of steel casing

3 - Collected using ORS brand oil/water interface probe

4 - Correction equation used: Reference elevation - (depth to water - (product thickness X 0.95))

Prepared by / Date: SAI 04/25/19 Checked by / Date: CTM 04/25/19

Table 3-5 Plant B Water Level and Product Recovery Data: January 2019 - March 2019 ¹ Semi-Annual Status Report No. 24 Olin Chemical Superfund Site Wilmington, Massachusetts

	D	epth to Wate	er	De	epth to Produ	ıct	Pr	oduct Thickne	ess	Reference	Potentiometric	Surface Elevation	on (feet NGVD)	Pro	duct Remov	/ed
Well		feet ²			feet ²			feet ^{3, 4}		Elevation	Co	rrected for Produ	ct ⁵	gallons		
ID	1/30/2019	2/26/2019	3/29/2019	1/30/2019	2/26/2019	3/29/2019	1/30/2019	2/26/2019	3/29/2019	feet	1/30/2019	2/26/2019	3/29/2019	1/30/2019	2/26/2019	3/29/2019
B-2	11.33	11.51	11.46	NPD	NPD	NPD	NA	NA	NA	90.48	79.15	78.97	79.02			
B-3	10.88	10.97	10.82	NPD	NPD	NPD	NA	NA	NA	90.32	79.44	79.35	79.50			ĺ
B-5R	11.08	11.21	11.13	NPD	NPD	NPD	NA	NA	NA	91.38	80.30	80.17	80.25			
B-7A	10.90	11.03	7.71	NPD	NPD	NPD	NA	NA	NA	88.81	77.91	77.78	81.10			ĺ
B-17	11.10	8.64	9.11	NPD	NPD	NPD	NA	NA	NA	91.55	80.45	82.91	82.44			ĺ
GW-13	11.07	11.20	11.15	NPD	NPD	NPD	NA	NA	NA	90.57	79.50	79.37	79.42			
GW-14	8.64	8.76	8.95	NPD	NPD	NPD	NA	NA	NA	88.70	80.06	79.94	79.75			ĺ
GW-15	7.91	8.07	8.22	NPD	NPD	NPD	NA	NA	NA	90.01	82.10	81.94	81.79			
GW-16R	10.40	10.53	10.52	NPD	NPD	NPD	NA	NA	NA	92.46	82.06	81.93	81.94			
GW-23	11.70	11.64	11.57	10.91	11.62	11.55	0.79	0.02	0.02	91.04	80.09	79.42	79.49			
GW-52S	8.95	9.04	8.24	NPD	NPD	NPD	NA	NA	NA	87.95	79.00	78.91	79.71			
GW-100	11.39	11.49	11.14	NPD	NPD	NPD	NA	NA	NA	90.15	78.76	78.66	79.01			
GW-101	11.38	11.50	11.14	NPD	NPD	NPD	NA	NA	NA	90.14	78.76	78.64	79.00			
GW-102	10.07	10.28	10.01	NPD	NPD	NPD	NA	NA	NA	89.00	78.93	78.72	78.99			
IW-1	11.37	11.43	11.23	NPD	NPD	NPD	NA	NA	NA	90.71	79.34	79.28	79.48			
IW-2	11.41	11.50	11.20	NPD	NPD	NPD	NA	NA	NA	90.53	79.12	79.03	79.33			
IW-3	11.67	11.75	11.35	NPD	NPD	NPD	NA	NA	NA	90.76	79.09	79.01	79.41			
IW-6	10.55	10.73	10.31	NPD	NPD	NPD	NA	NA	NA	89.15	78.60	78.42	78.84			
IW-7	11.47	11.67	11.03	NPD	NPD	NPD	NA	NA	NA	90.10	78.63	78.43	79.07			
IW-8	11.17	11.36	10.87	NPD	NPD	NPD	NA	NA	NA	89.94	78.77	78.58	79.07			
IW-9	10.91	11.04	10.63	NPD	NPD	NPD	NA	NA	NA	89.78	78.87	78.74	79.15			1
IW-10	11.43	11.57	11.29	NPD	NPD	NPD	NA	NA	NA	90.43	79.00	78.86	79.14			
IW-11	10.88	13.30	10.89	10.86	13.23	NPD	0.02	0.07	NA	89.92	79.06	76.69	79.03			
IW-12	10.91	13.68	11.33	NPD	NPD	NPD	NA	NA	NA	90.31	79.40	76.63	78.98			
IW-13	19.57	18.56	10.68	19.57	NPD	NPD	Trace	NA	NA	89.90	70.33	71.34	79.22			
PID	11.29	11.07	10.89	NPD	NPD	NPD	NA	NA	NA	89.97	78.68	78.90	79.08			
P5	11.47	11.59	11.28	NPD	NPD	11.27	NA	NA	0.01	90.45	78.98	78.86	79.18			
12-IN	10.68		10.50	NPD		NPD	NA		NA	89.84	79.16		79.34			<u> </u>
											Recov	ered Product For	Month	0.01	0.03	0.02

Notes:

NPD - No Product Detected; NA - Not Applicable

1 - Groundwater measurements and product recovery data collected by Olin

2 - Measurement collected from top of PVC; if well does not have PVC casing, measurement taken from top of steel casing

3 - Collected using ORS brand oil/water interface probe

4 - Correction equation used: Reference elevation - (depth to water - (product thickness X 0.95))

Prepared by / Date: SAM 04/25/19 Checked by / Date: CTM 04/25/19

Table 5-1 Private Well Analytical Results for the Fourth Quarter 2018 Semi-Annual Status Report No. 24 Olin Chemical Superfund Site Wilmington, Massachusetts

	OC-M01L6C	OC-M01L6D	OC-M02L07	OC-M03L02	OC-M03L2D	OC-M03L2F	OC-M03L07	OC-M14L2B	OC-M15L2C	OC-M24L54	OC-M24L63	OC-M24L64
	12/6/2018	12/6/2018	12/6/2018	12/7/2018	12/7/2018	12/7/2018	12/6/2018	12/6/2018	12/7/2018	12/6/2018	12/6/2018	12/7/2018
Parameter Name												
NDMA												
N-Nitrosodimethylamine	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2.1 U	2 U	15	2 U	2.1 U
Metals, Total (mg/L)												
Chromium			0.01 U					0.01 U	0.01 U	0.00067 J	0.0015 J	0.01 U
Chromium, Hexavalent			0.01 U					0.01 U	0.0061 J	0.01 U	0.01 U	0.0073 J
Sodium			6.9					28	21	30	24	25
Inorganics (mg/L)												
Ammonia			0.12 J					0.2 U	0.11 J	0.2 U	0.19 J	0.12 J
Chloride			13					15	140	87	130	130
Nitrate as N			2.9					0.05 U	0.05 U	0.05 U	0.47	0.6
Sulfate			19					60	38	29	24	24

Notes:

mg/L - milligram per liter

ng/L = nanograms per liter

U - analyte not detected,

value shown is detection limit

J - value is estimated

R - value is rejected

Table 5-1 Private Well Analytical Results for the Fourth Quarter 2018 Semi-Annual Status Report No. 24 Olin Chemical Superfund Site Wilmington, Massachusetts

	OC-M24L66	OC-M24L72A	OC-M24L94
	12/6/2018	12/6/2018	12/6/2018
Parameter Name			
NDMA			
N-Nitrosodimethylamine	2.1 U	2 U	2.1 UJ
Metals, Total (mg/L)			
Chromium	0.01 U	0.00077 J	0.0014 J
Chromium, Hexavalent			0.01 U
Sodium	2.6 J	20	49
Inorganics (mg/L)			
Ammonia	0.13 J	0.2 U	0.2 U
Chloride	3.7	120	88
Nitrate as N	0.05 U	0.6	1.2
Sulfate	12	22	21

Notes:

Prepared by: KMS 6/18/19 Checked by: CTM 6/27/19

mg/L - milligram per liter

ng/L = nanograms per liter

U - analyte not detected, value shown is detection limit

J - value is estimated

R - value is rejected

Table 5-2 Private Well Analytical Results for the First Quarter 2019 Semi-Annual Status Report No. 24 Olin Chemical Superfund Site

Wilmington,	Massachusetts

	OC-M01L6C	OC-M01L6D	OC-M02L07	OC-M03L02	OC-M03L2D	OC-M03L2F	OC-M03L07	OC-M03L07	OC-M14L2B	OC-M15L2C
	3/21/2019	3/21/2019	3/21/2019	3/21/2019	3/21/2019	3/21/2019	3/21/2019	4/12/2019	3/21/2019	3/22/2019
Parameter Name										
NDMA/NDPA (ng/L)										
N-Nitrosodimethylamine	0.55 J	3.6	0.34 J	2 U	2 U	2 U	20	2 U	2.1 UJ	2 U
Metals, Total (mg/L)										
Sodium			8.8						26	26
Chromium			0.0011 J						0.01 U	0.00091 J
Inorganics (mg/L)										
Chloride			20						16	140
Nitrate as N			5.7						0.05 U	
Ammonia as Nitrogen			0.2 U						0.2 U	0.12 J
Sulfate			18						49	27

Notes:

mg/L - milligram per liter

ng/L - nanograms per liter

U - analyte not detected,

value shown is detection limit

J - value is estimated

Table 5-2 Private Well Analytical Results for the First Quarter 2019 Semi-Annual Status Report No. 24 Olin Chemical Superfund Site Wilmington, Massachusetts

	OC-M24L54	OC-M24L63	OC-M24L64	OC-M24L66	OC-M24L94
	3/22/2019	3/22/2019	3/22/2019	3/22/2019	3/22/2019
Parameter Name					
NDMA/NDPA (ng/L)					
N-Nitrosodimethylamine	9.5	2 U	2 U	2 U	2 U
Metals, Total (mg/L)					
Sodium	31	20	20	1.9 J	28
Chromium	0.01 U	0.00072 J	0.00065 J	0.01 U	0.01 U
Inorganics (mg/L)					
Chloride	82	120	120	2.5	110
Nitrate as N					
Ammonia as Nitrogen	0.42 U	0.23 U	0.2 U	0.2 U	0.22 U
Sulfate	25	20	20	8.3	19

Prepared by: KMS 6/20/19

Checked by: CTM 6/27/19

Notes:

mg/L - milligram per liter

ng/L - nanograms per liter

U - analyte not detected,

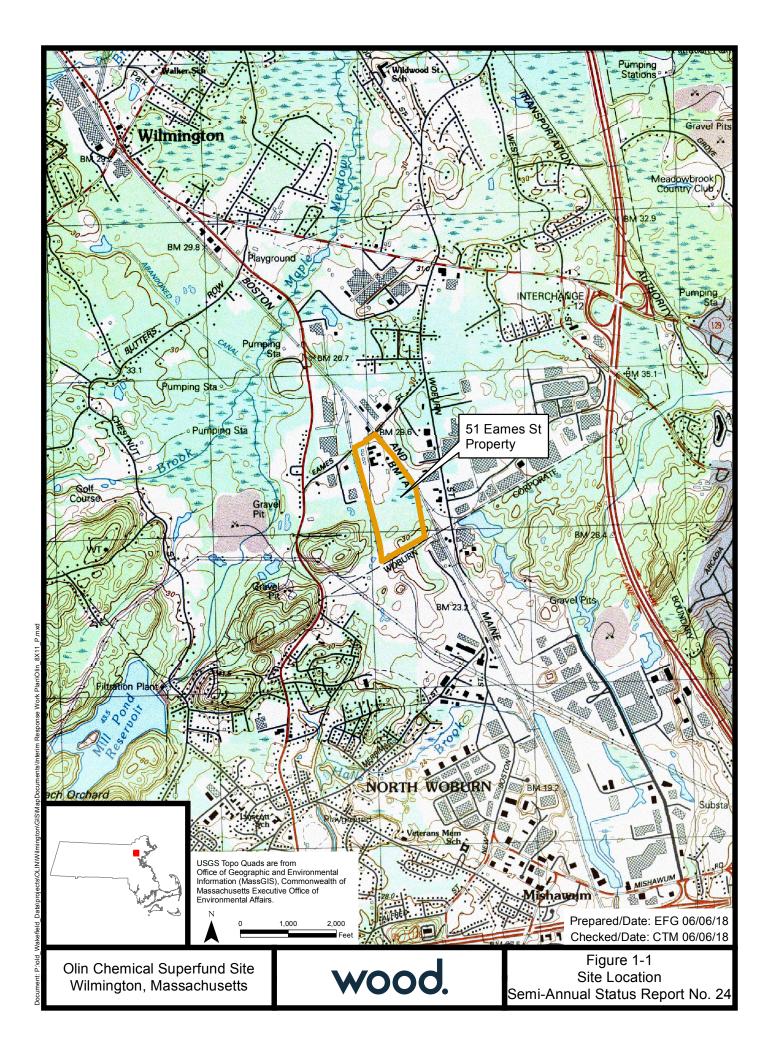
value shown is detection limit

J - value is estimated

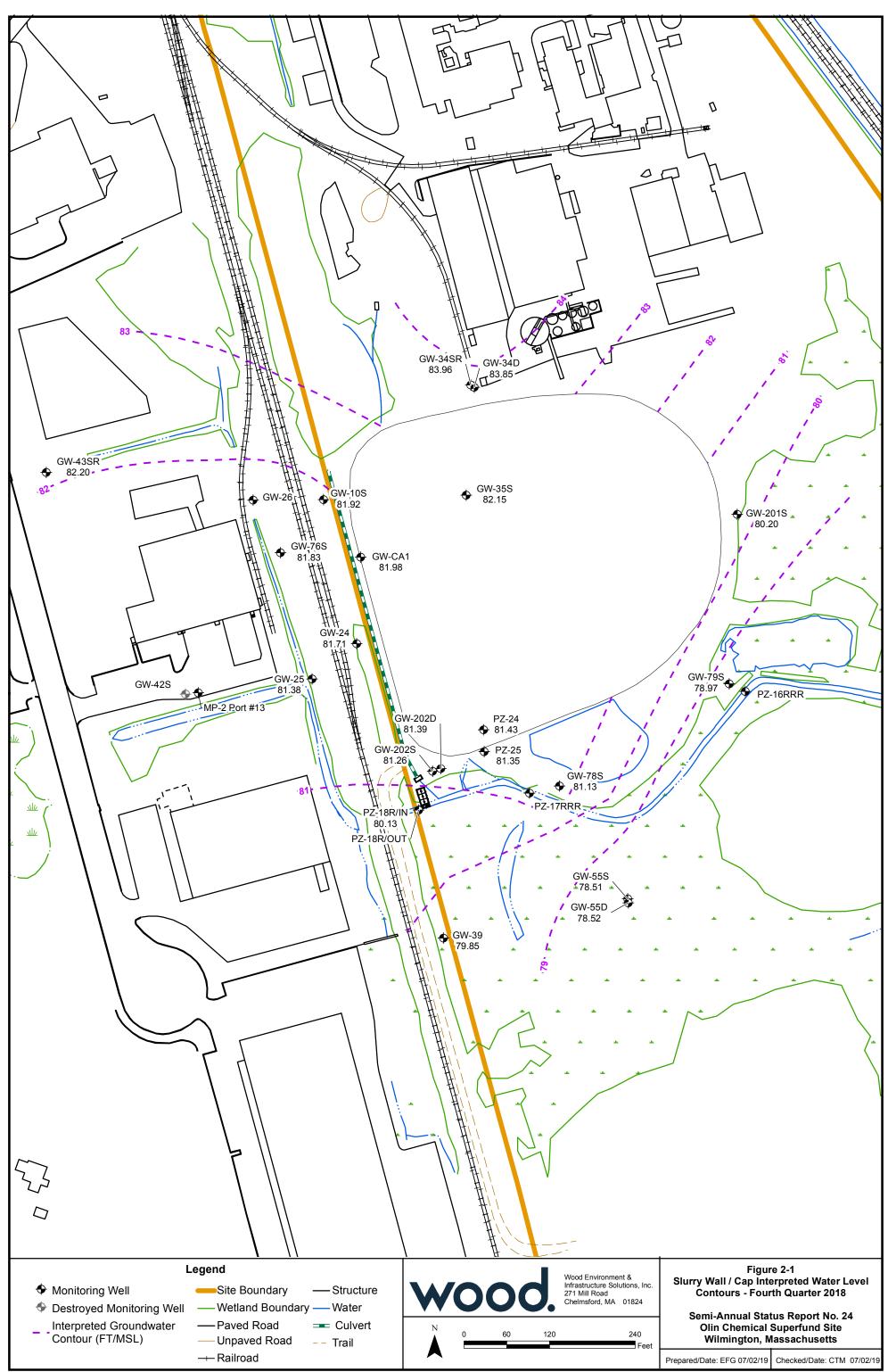
wood.

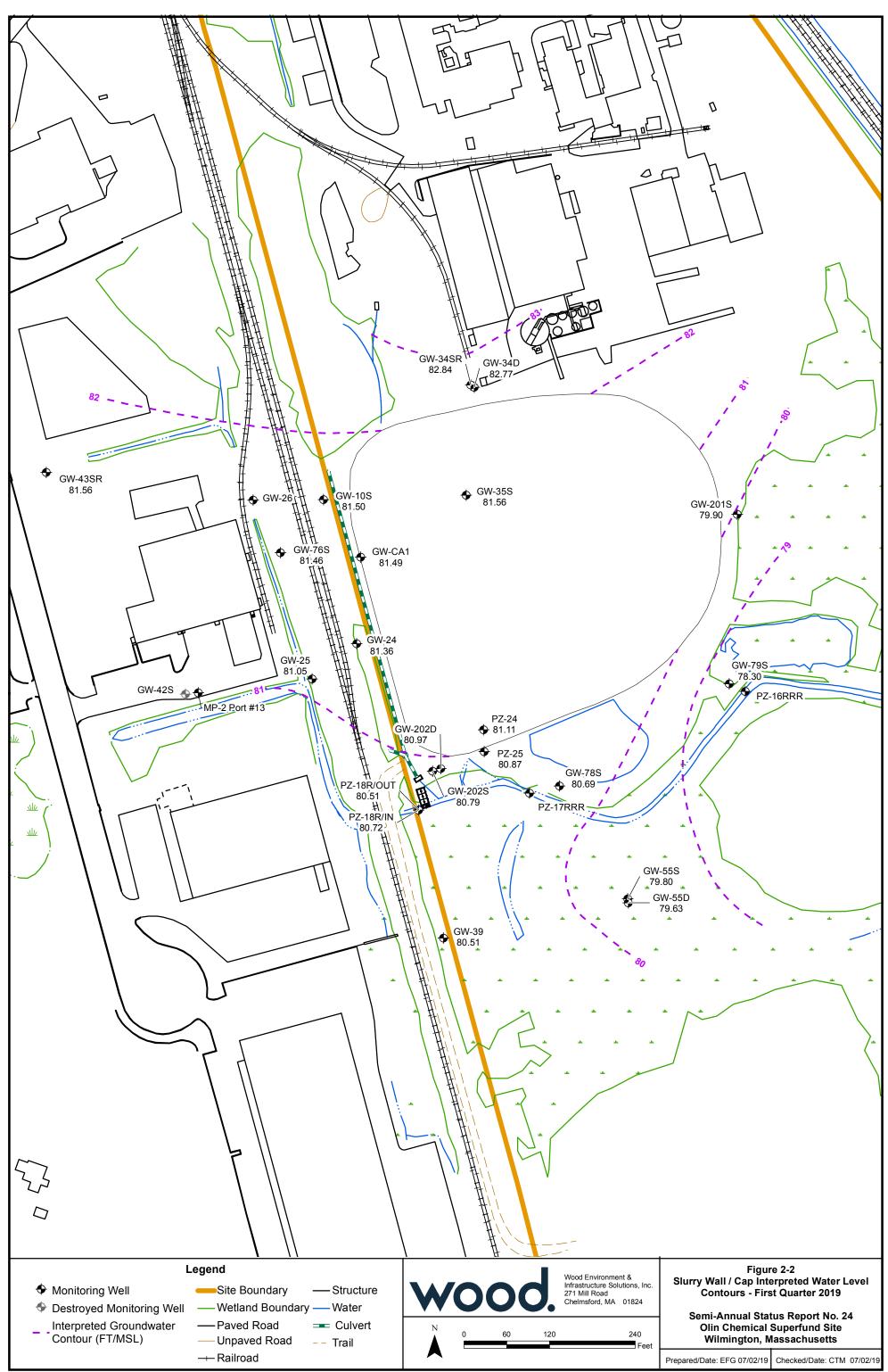
Figures

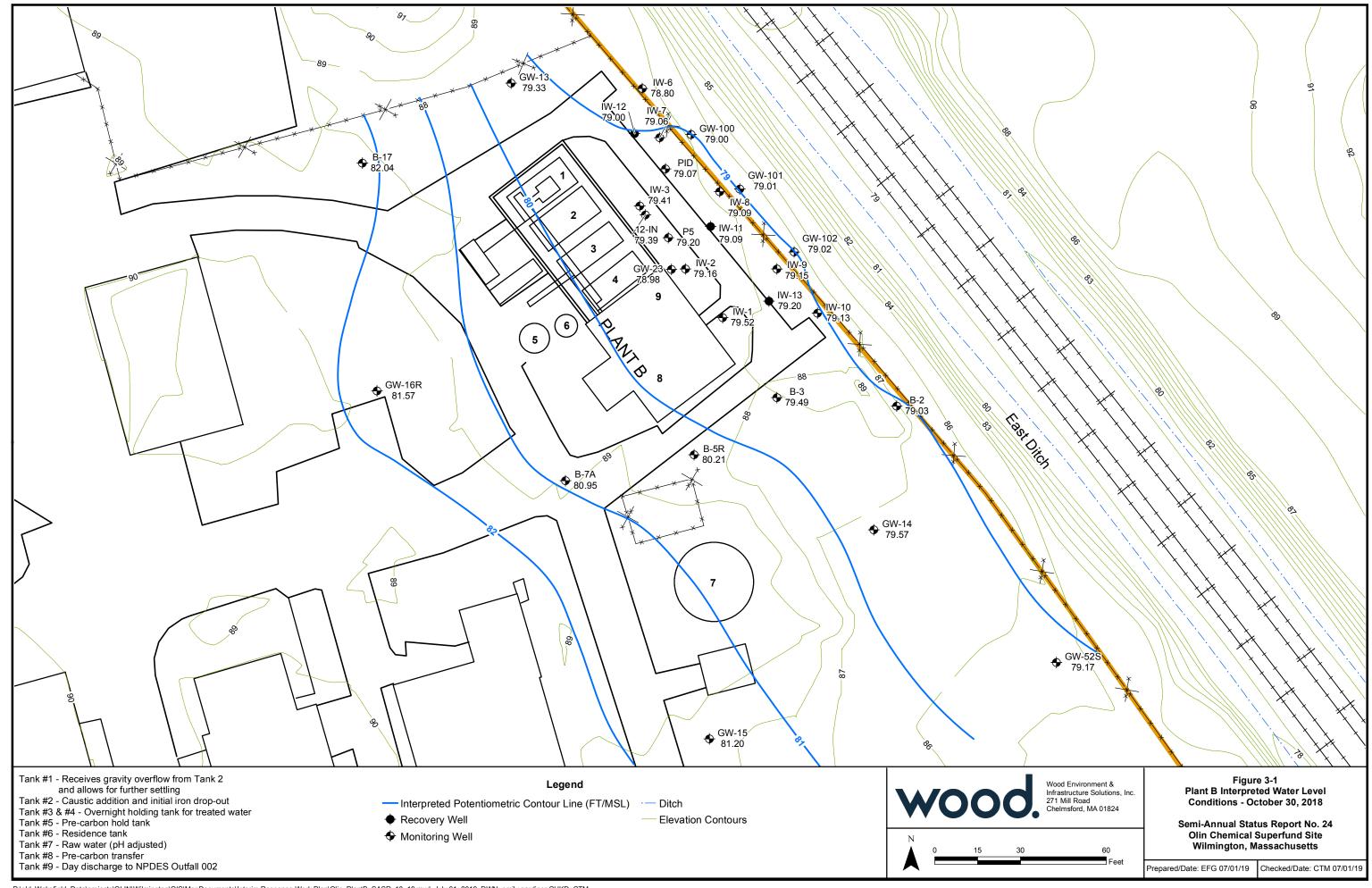


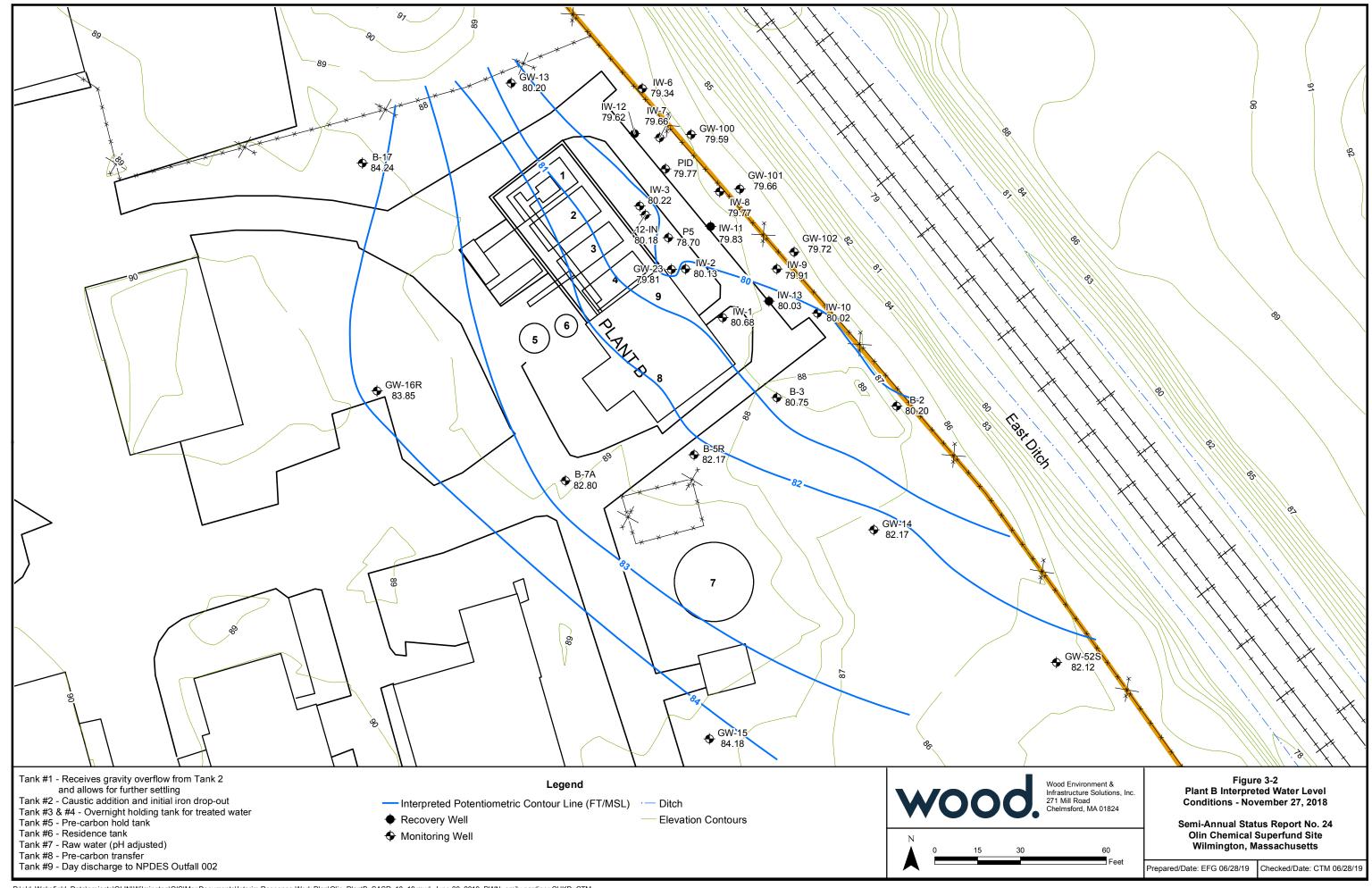


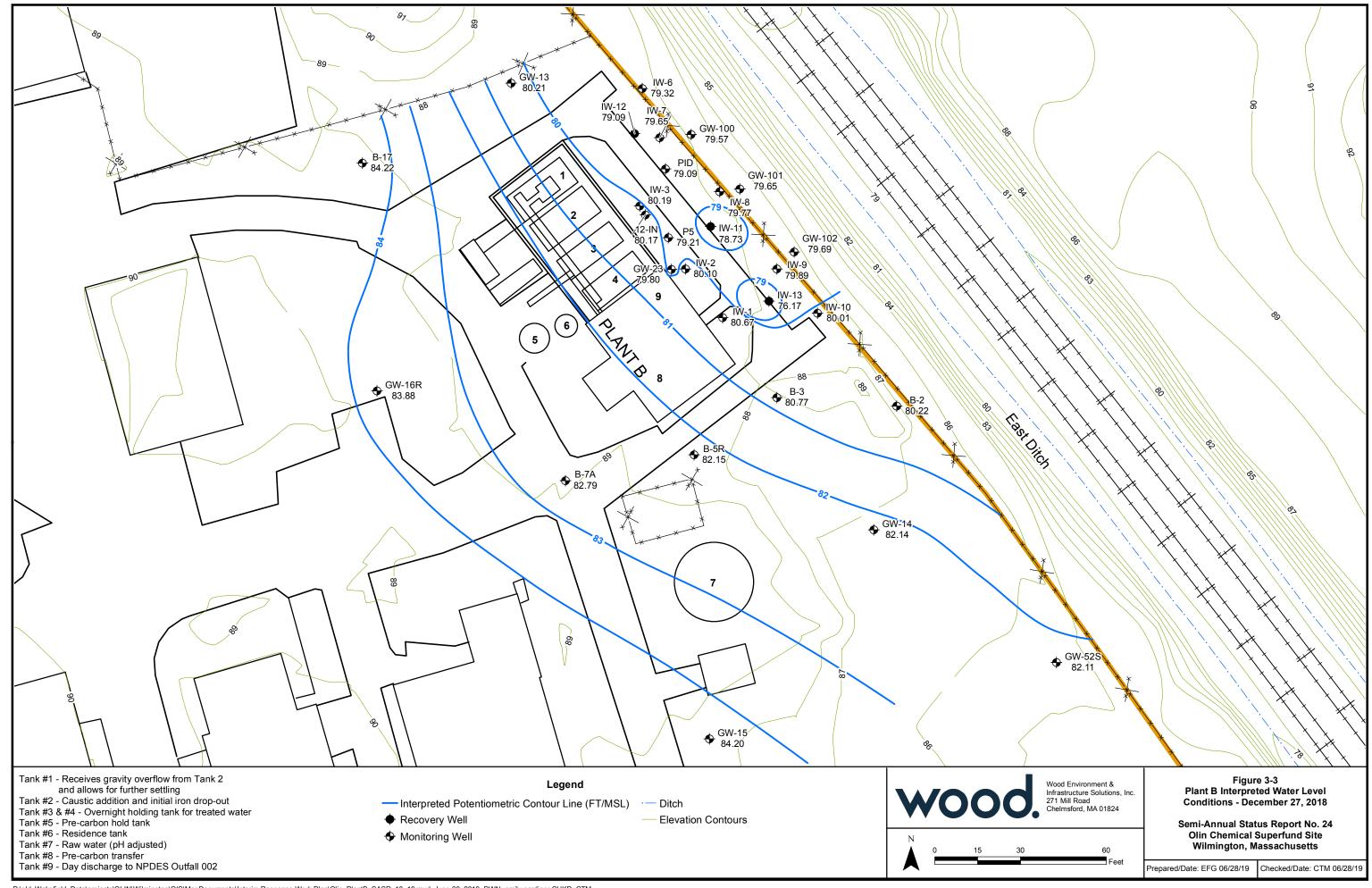


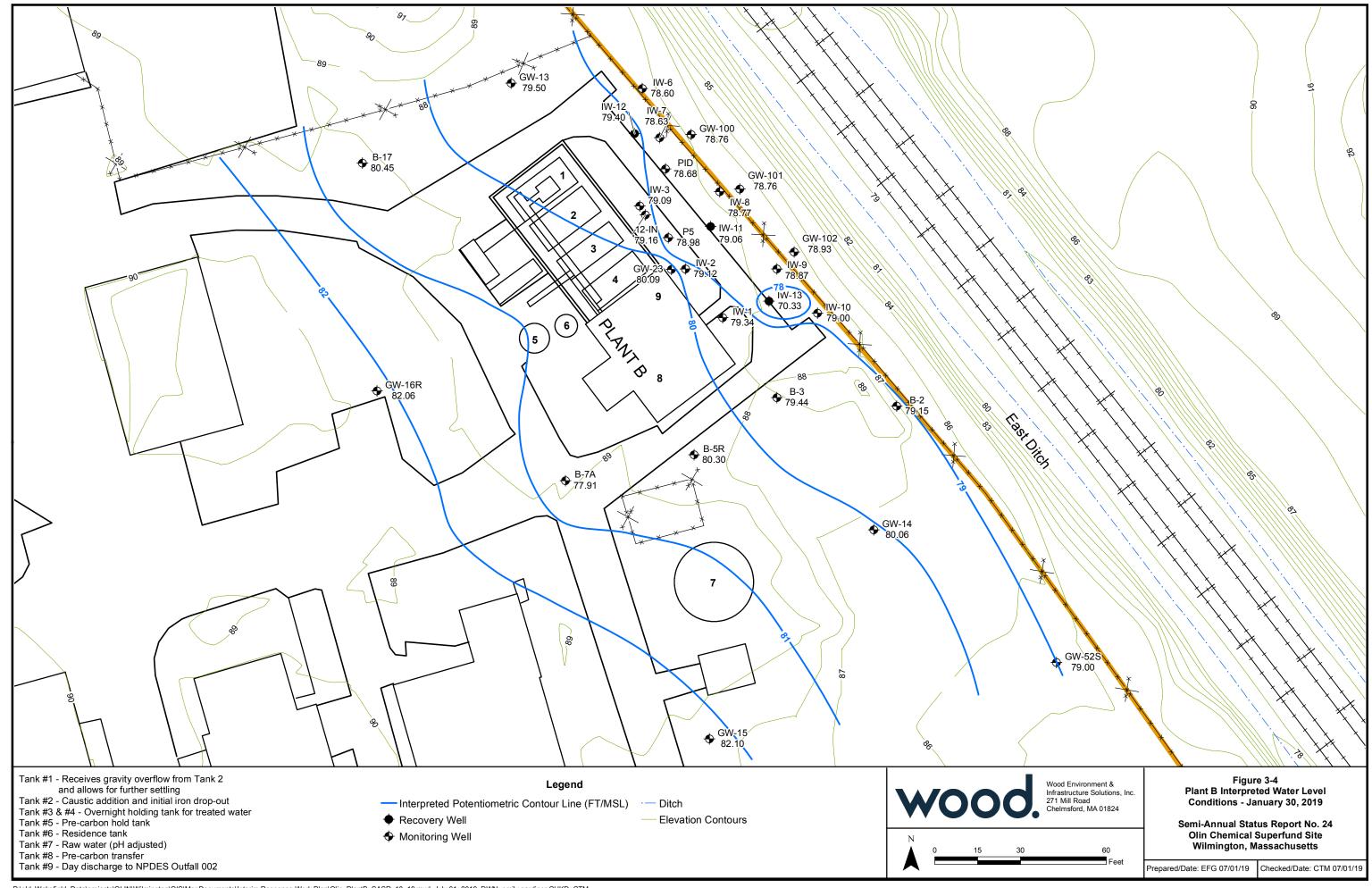


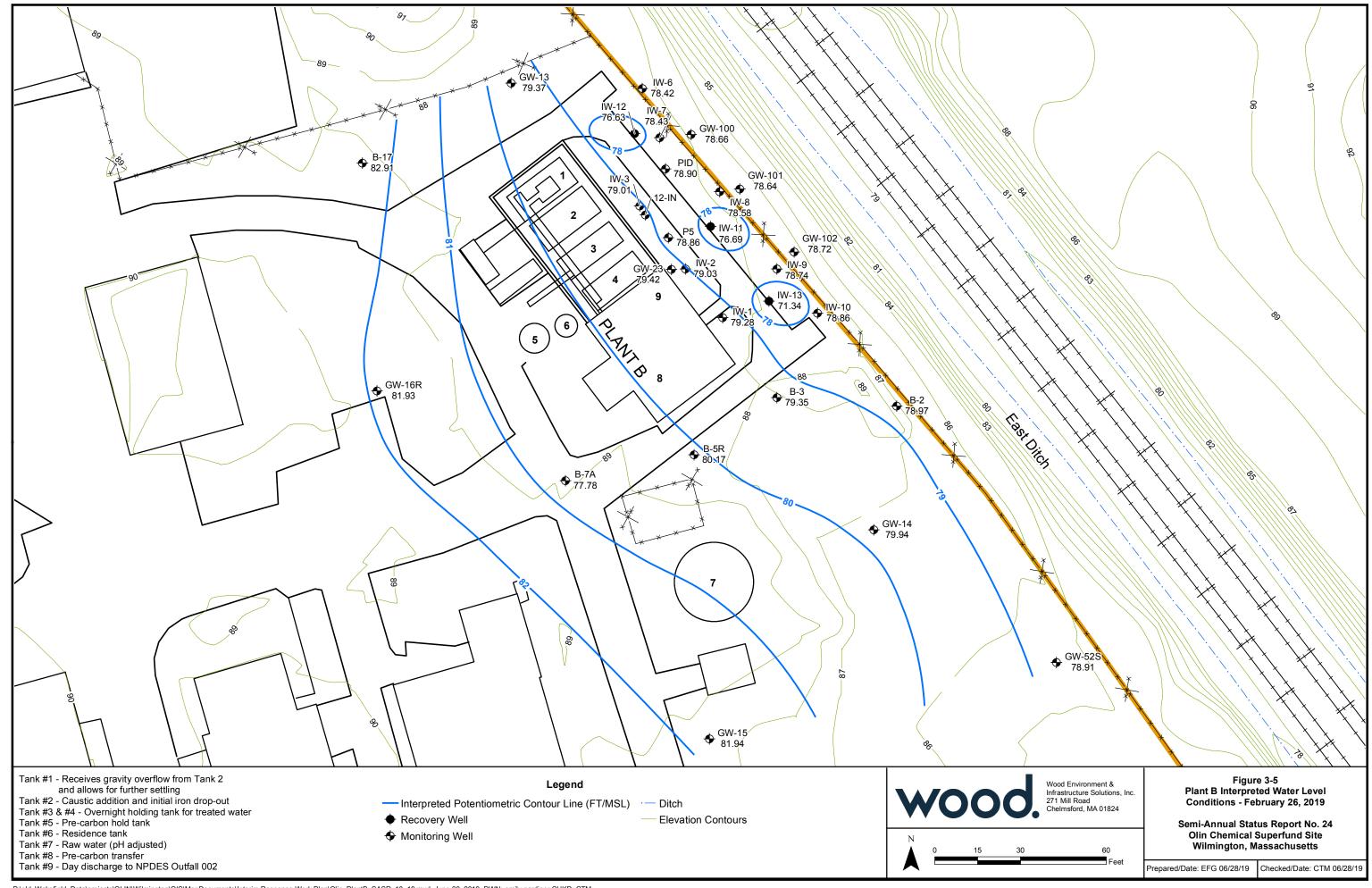


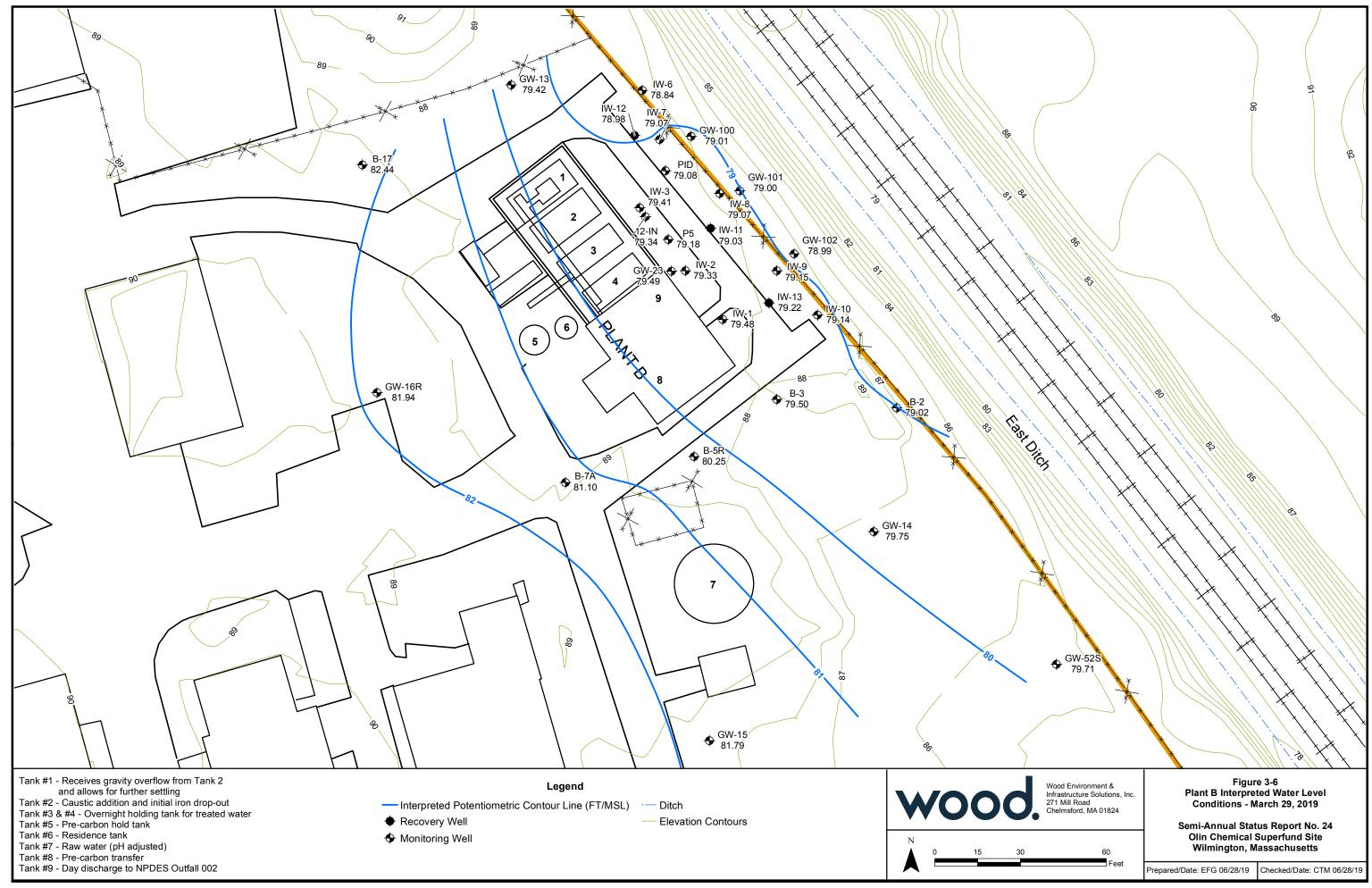


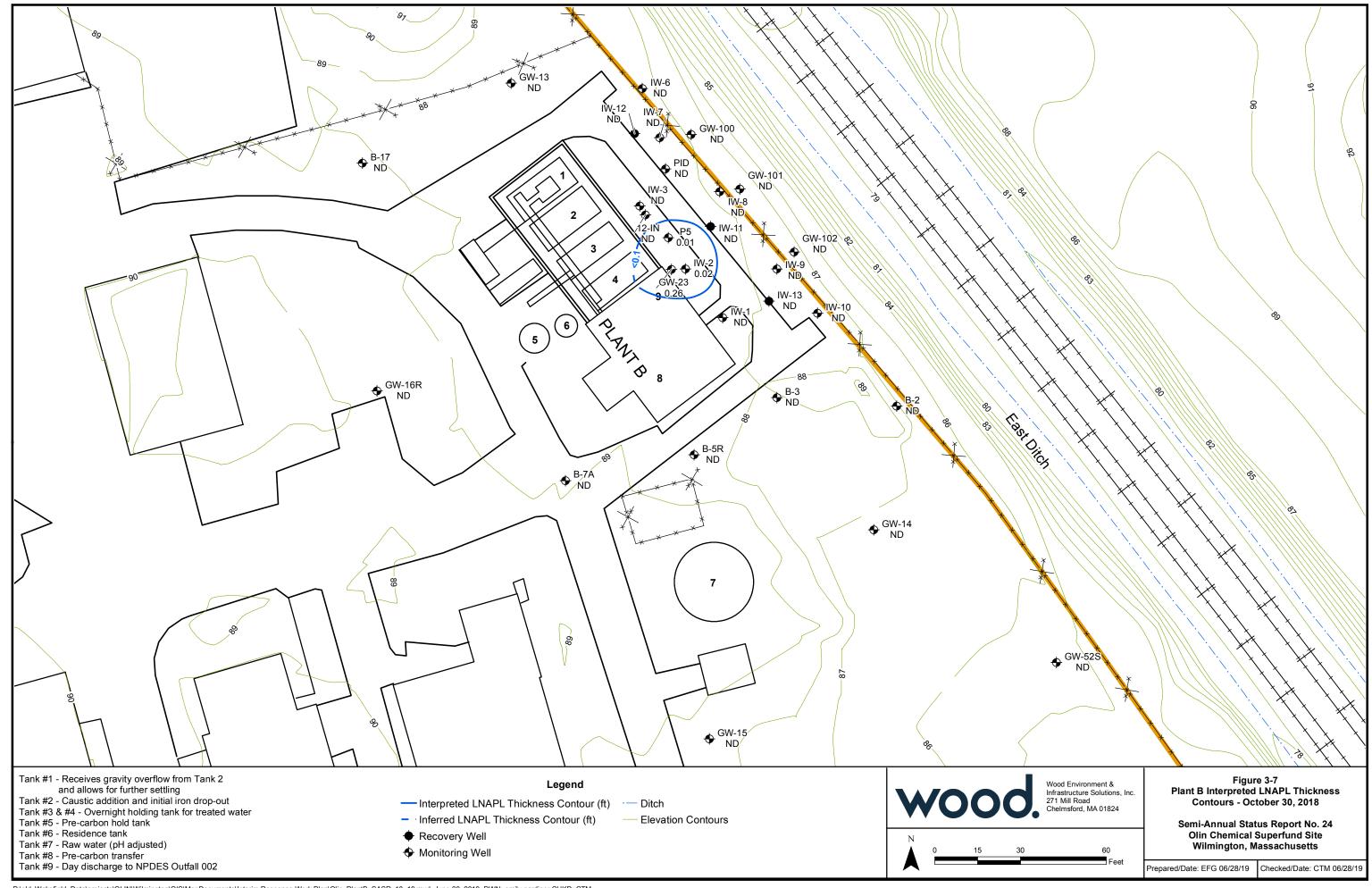


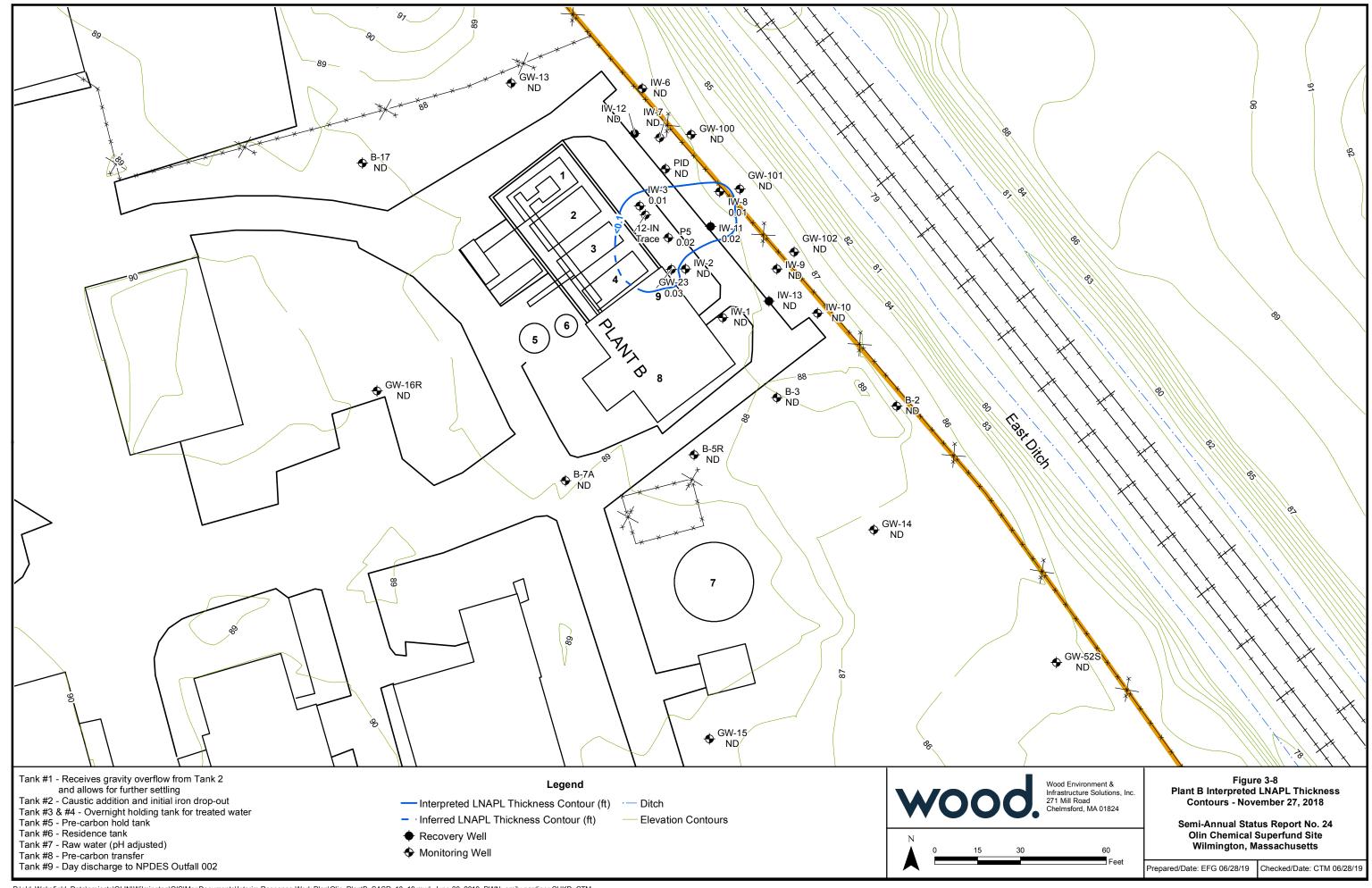


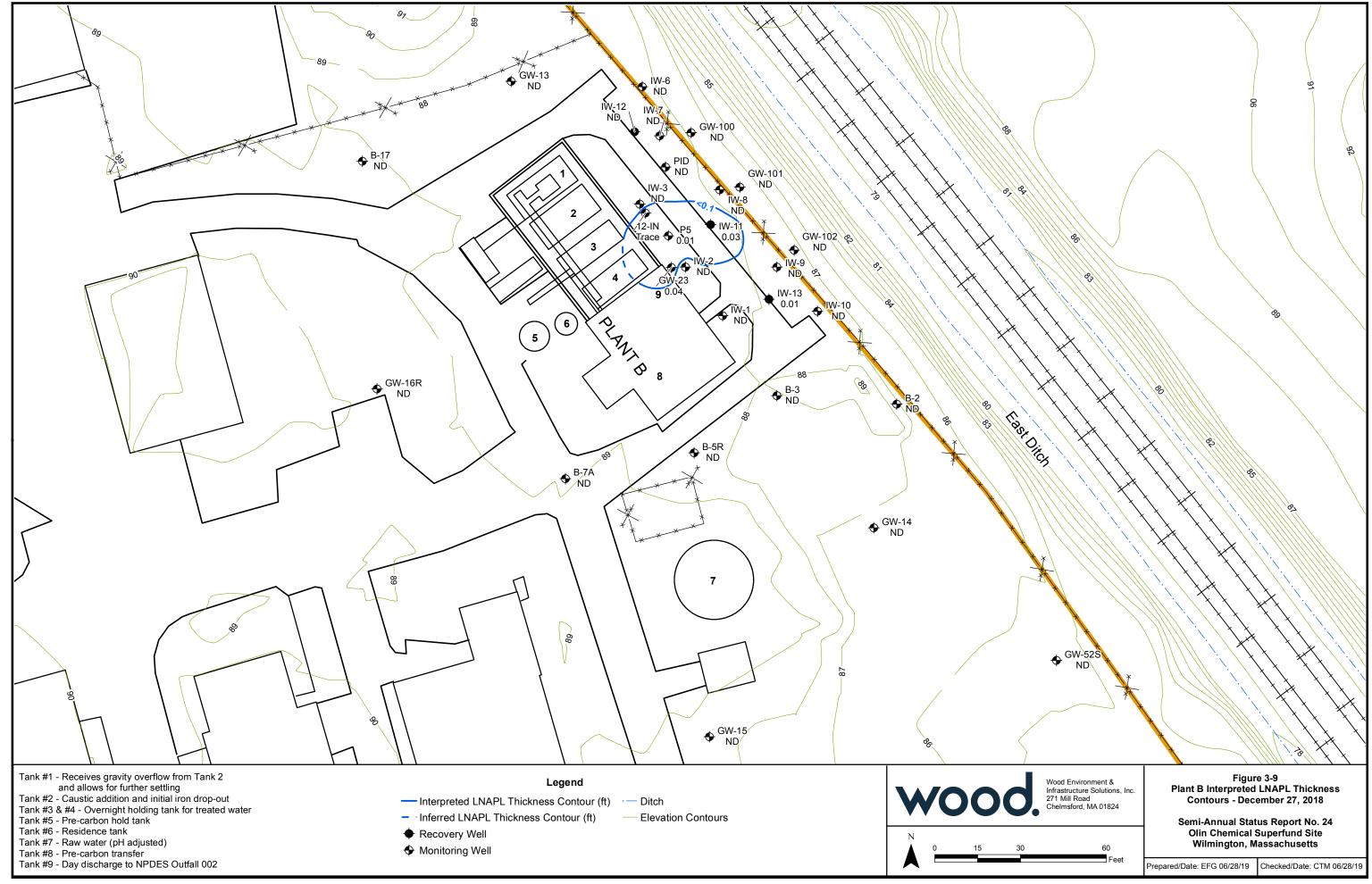


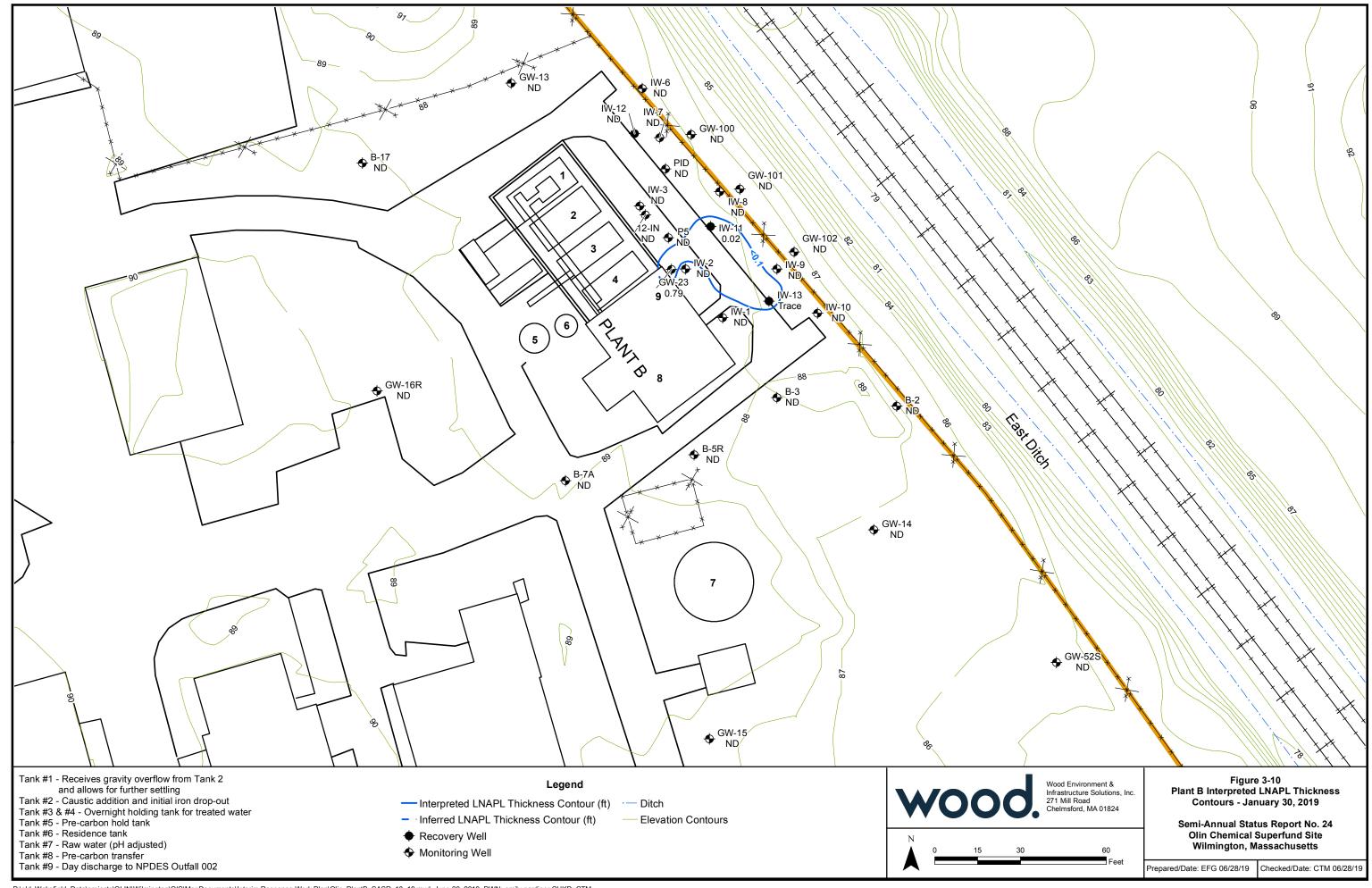


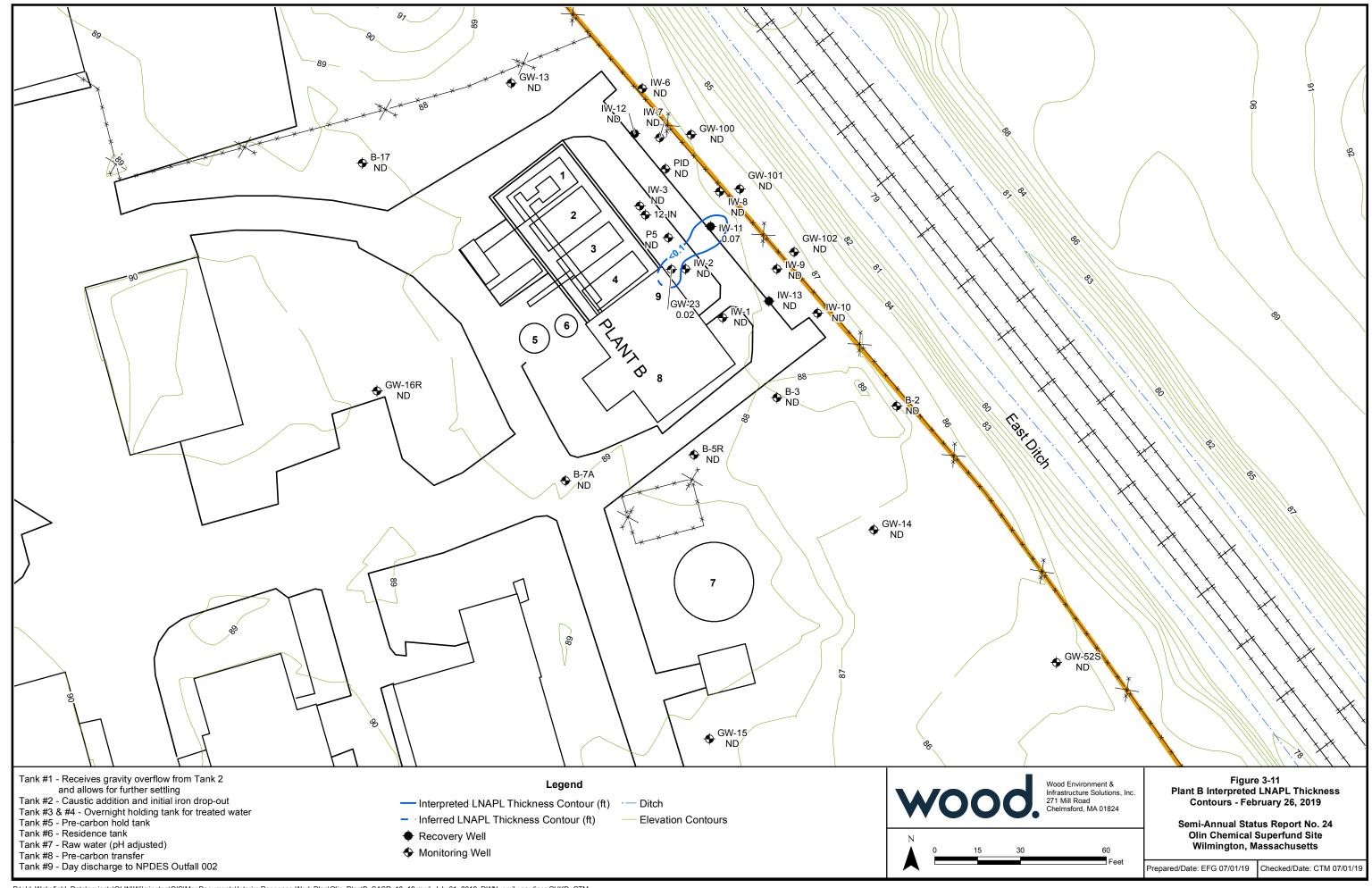












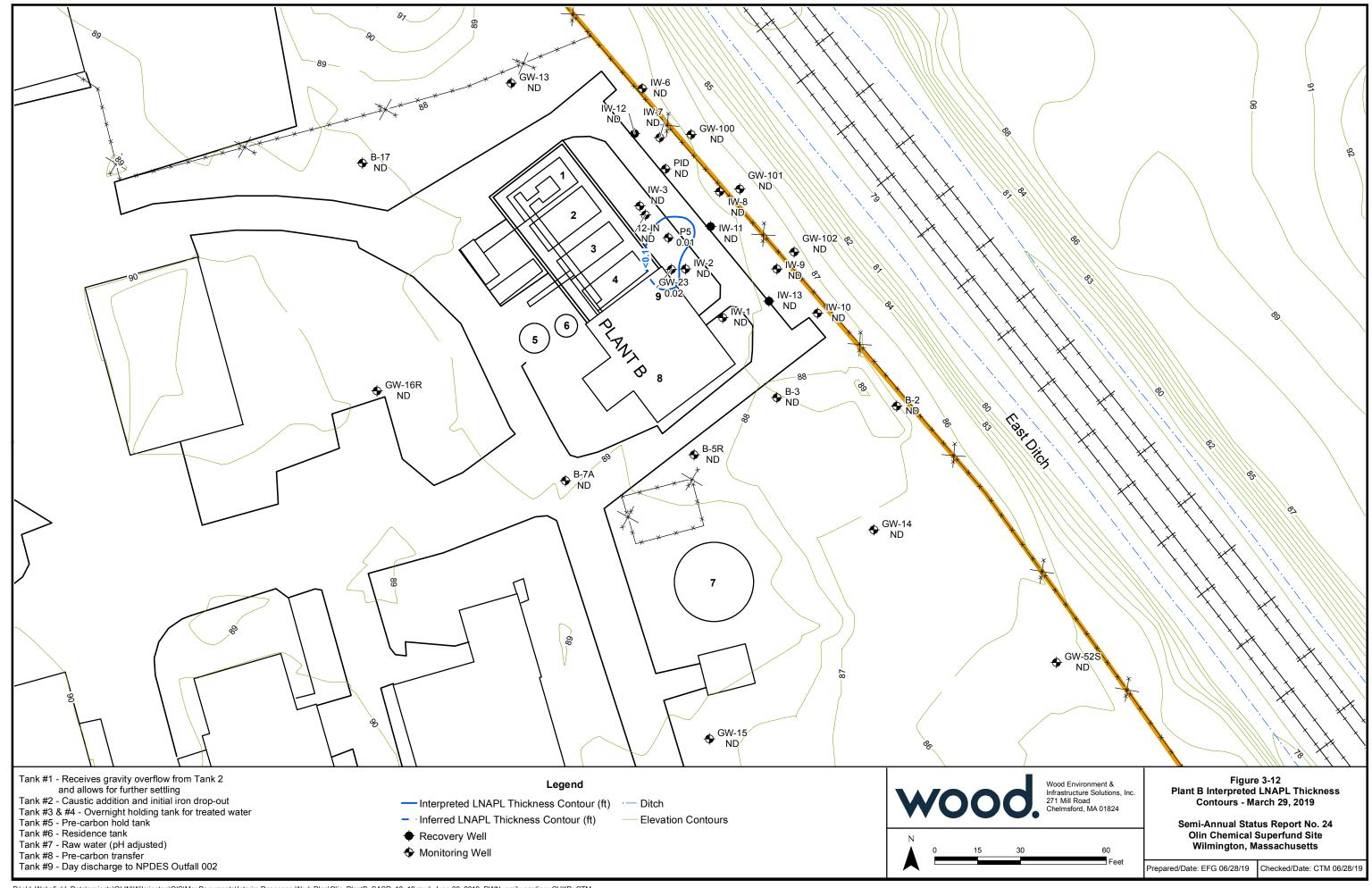


Figure 3-13
Monthly and Cumulative LNAPL Recovery
Semi-Annual Status Report No. 24
Olin Chemical Superfund Site
Wilmington, Massachusetts

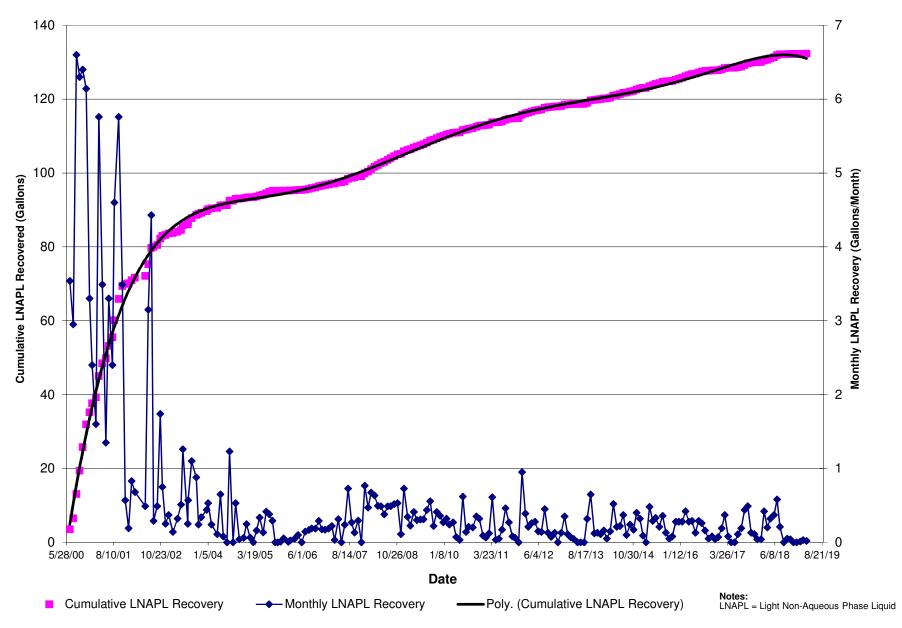
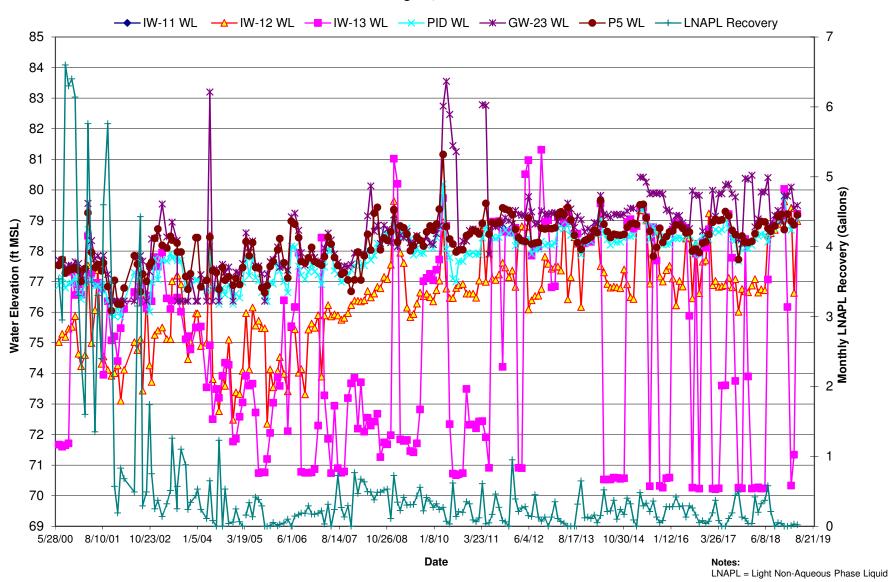
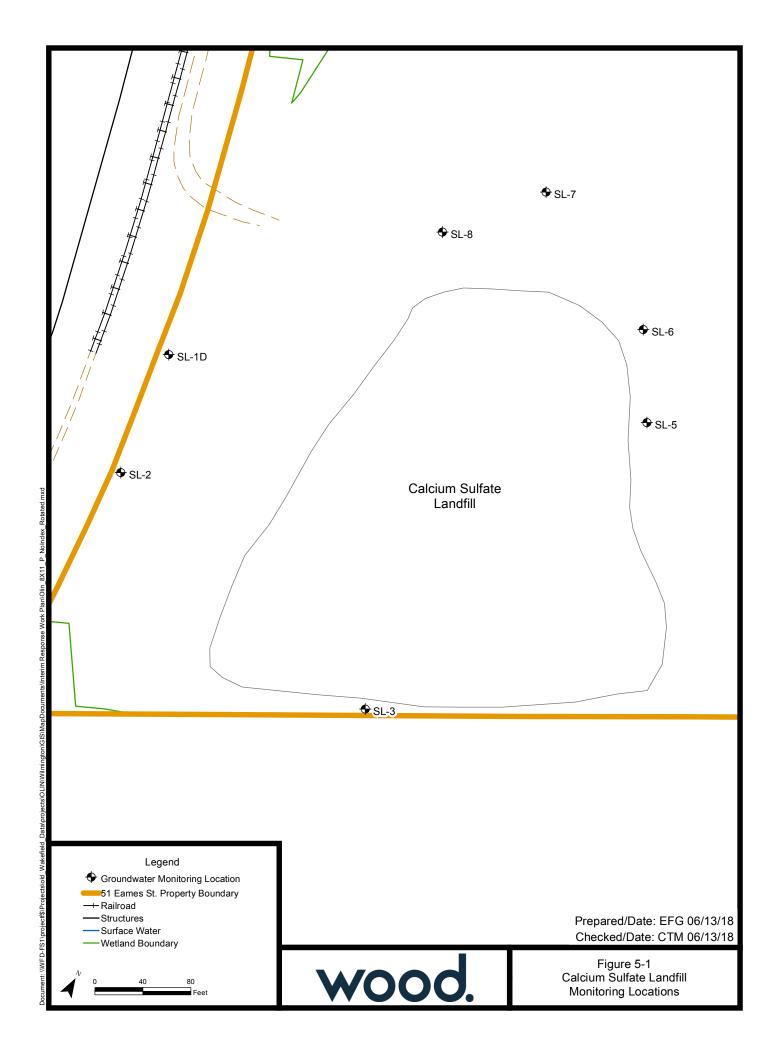


Figure 3-14
Water Levels (WL) and Monthly LNAPL Recovery
Semi-Annual Status Report No. 24
Olin Chemical Superfund Site
Wilmington, Massachusetts





wood.

Appendix A

Interim Response Steps Field Activity Reports



wood.

Appendix A1

Fourth Quarter 2018 Sampling Event





Interim Response Steps Field Activity Report Fourth Quarter 2018 Sampling Event

Olin Chemical Superfund Site Wilmington, Massachusetts Project 6107190016

Prepared for:



Interim Response Steps Field Activity Report Fourth Quarter 2018 Sampling Event

Olin Chemical Superfund Site Wilmington, Massachusetts

Project 6107190016

Prepared for:

Olin Corporation 3855 North Ocoee St., Suite 200, Cleveland, TN 37312

Prepared by:

Wood Environment & Infrastructure Solutions, Inc. 271 Mill Road 3rd Floor Chelmsford, MA 01824 USA

T: 978-692-9090

1-Jul-19

Prepared and Reviewed by:

Peter H. Thompson

Senior Principal Hydrogeologist

Michael J. Murphy Principal Scientist

My Musphy

Copyright and non-disclosure notice

The contents and layout of this report are subject to copyright owned by Wood (© Wood Environment & Infrastructure Solutions, Inc.). save to the extent that copyright has been legally assigned by us to another party or is used by Wood under license. To the extent that we own the copyright in this report, it may not be copied or used without our prior written agreement for any purpose other than the purpose indicated in this report. The methodology (if any) contained in this report is provided to you in confidence and must not be disclosed or copied to third parties without the prior written agreement of Wood. Disclosure of that information may constitute an actionable breach of confidence or may otherwise prejudice our commercial interests. Any third party who obtains access to this report by any means will, in any event, be subject to the Third-Party Disclaimer set out below.

Third-party disclaimer

Any disclosure of this report to a third party is subject to this disclaimer. The report was prepared by Wood at the instruction of, and for use by, our client named on the front of the report. It does not in any way constitute advice to any third party who is able to access it by any means. Wood excludes to the fullest extent lawfully permitted all liability whatsoever for any loss or damage howsoever arising from reliance on the contents of this report. We do not however exclude our liability (if any) for personal injury or death resulting from our negligence, for fraud or any other matter in relation to which we cannot legally exclude liability.

Table of contents

1.0	INTROE	DUCTION1								
	1.1	Limitations								
2.0	Slurry Wall/Cap monitoring program									
	2.1	Scope	of Work							
		2.1.1	Groundwater Level Measurement							
		2.1.2	Groundwater Sampling							
		2.1.3	Surface Water Sampling							
		2.1.4	Sediment Sampling							
		2.1.5	Data Logger Data Download							
2.0		2.1.6	Cap Inspection							
3.0			ring program							
	3.1		of Work							
		3.1.1 3.1.2	Groundwater Level Measurements and LNAPL Gauging Groundwater Sampling							
4.0	Poforon		Groundwater Sampling							
4.0	Kelelel	ices		0						
			List of tables							
Table 1		Groundwater and Surface Water Sampling Locations – Slurry Wall/Cap Monitoring								
		_	Program							
			Groundwater Elevations – Slurry Wall/Cap Monitoring Program							
Table 3			eld Parameters for Groundwater Sampling – Slurry Wall/Cap Monitoring Progran	n						
Table 4 Table 5			Iwater Laboratory Analytical Program – Slurry Wall/Cap Monitoring Program							
Table 5			eld Parameters for Surface Water Sampling – Slurry Wall/Cap Monitoring Progra • Water Analytical Program – Slurry Wall/Cap Monitoring Program	Ш						
Table 7			ent Analytical Program – Slurry Wall/Cap Monitoring Program							
Table 8			Iwater Elevations – Plant B Monitoring Program							
Table 9			eld Parameters for Groundwater Sampling – Plant B Monitoring Program							
Table 10			Groundwater Laboratory Analytical Program – Plant B Monitoring Program							
rubic 1	O	Ground	indical Education of Analytical Programs - Plant B Monitoring Programs							
			List of figures							
Figure 1	1	Slurry \	Wall/Cap Monitoring Program Sampling Locations							
Figure 2		Plant B Monitoring Program Sampling Locations								
900 -	_		mememy region company according							
			List of appendices							
Appendix A		Field Data Records and Field Instrument Calibration Records								
Append		Chain c	of Custody Records							
Append	dix C	Cap Ins	spection Log							
			List of acronyms							
Amec F	oster Wl	neeler	Amec Foster Wheeler Environment and Infrastructure, Inc.							
DO			Dissolved Oxygen							
IRSWP			Interim Response Steps Work Plan							
LNAPL			Light Non-Aqueous Phase Liquid							

MACTEC Engineering and Consulting, Inc.

NTU Nephelometric Turbidity Units
ORP Oxidation/Reduction Potential

RI/FS Remedial Investigation/Feasibility Study

SC Specific Conductivity

TAL TestAmerica Laboratories, Inc.

USEPA United States Environmental Protection Agency

UV Ultraviolet

Wood Wood Environment & Infrastructure Solutions, Inc.





1.0 INTRODUCTION

On behalf of the Olin Corporation (Olin), Wood Environment & Infrastructure Solutions, Inc. (Wood E&IS) formerly Amec Foster Wheeler, presents this summary report for field activities completed in association with the Fourth Quarter 2018 groundwater, surface water, and sediment monitoring for the Slurry Wall/Cap Monitoring Program and the Plant B Monitoring Program. These activities were conducted consistent with the requirements and procedures contained in the Final Interim Response Steps Work Plan (IRSWP), Olin Chemical Superfund Site, 51 Eames Street, Wilmington, Massachusetts dated August 8, 2008 and the Volume IIIB, the Quality Assurance Project Plan, of the Final Remedial Investigation/Feasibility Study (RI/FS) Work Plan dated August 14, 2009 (MACTEC Engineering and Consulting, Inc. [MACTEC], 2009).

1.1 Limitations

This report, including its findings, opinions, and conclusions, is intended for the exclusive use and benefit of, and may be relied upon only by Olin Corporation and the United States Environmental Protection Agency (USEPA).



2.0 Slurry Wall/Cap monitoring program

The purpose of the Slurry Wall/Cap Monitoring Program is to monitor the concentrations of select constituents in groundwater, surface water, and sediment in areas adjacent to and within the South Ditch of the former Olin Facility located at 51 Eames Street, Wilmington, Massachusetts.

The Fourth Quarter 2018 groundwater, surface water, and sediment monitoring program includes collecting groundwater level measurements from select monitoring wells and piezometers, collecting and analyzing groundwater samples from 15 monitoring wells and five piezometers, collecting and analyzing surface water samples from seven locations within the East Ditch and South Ditch, and collecting and analyzing sediment samples from five locations within the East Ditch and South Ditch. Groundwater, surface water, and sediment sample locations are listed in **Table 1** and shown on **Figure 1**. The groundwater, surface water, and sediment sampling program is further described in the Final IRSWP (MACTEC, 2008), which has been approved by the USEPA.

2.1 Scope of Work

The Slurry Wall/Cap Monitoring Program for this sampling event consists of collecting groundwater level measurements in the vicinity of the South Ditch area; collecting and analyzing groundwater samples from the following monitoring wells: GW-10S, GW-24, GW-25, GW-34SR, GW-34D, GW-35S, MP-2 #15, GW-43SR, GW-76S, GW-78S, GW-79S, GW-201S, GW-202S, GW-202D, and GW-CA-1; and piezometers: PZ-16RRR, PZ-17RRR, PZ-18R, PZ-24, and PZ-25; collecting and analyzing surface water samples from the following locations: ISCO-1, ISCO-2, ISCO-3, SD-17, PZ-16RRR, PZ-17RRR, and PZ-18R; collecting and analyzing sediment samples from the following locations: SD-1, SD-2, SD-3, SD-4, and SD-5; and downloading water level and barometric pressure data from data loggers that have been installed in the following wells and piezometers: GW-10S, GW-35S, GW-CA1, GW-76S, GW-78S, GW-CA3S, GW-CA4S, PZ-24, PZ-25, and GW-6S. Monitoring wells, piezometers, surface water, and sediment sample locations are shown on **Figure 1**.

2.1.1 Groundwater Level Measurement

On November 14 through 28, 2018, Olin personnel completed a site reconnaissance of the monitoring well locations in the Slurry Wall/Cap Monitoring Program and collected groundwater level measurements. This included measuring depth to groundwater from 22 monitoring wells and piezometers using a water level meter. Groundwater level measurements and calculated groundwater elevations are summarized in **Table 2**.

2.1.2 Groundwater Sampling

On November 14 through 28, 2018, Olin personnel sampled groundwater from 15 monitoring wells and five piezometers using 2017 USEPA low stress (low flow) groundwater sampling methods.

Prior to low flow sampling, a Horiba U-52 multi-parameter water quality meter and a Hach 2100Q turbidity meter were calibrated according to the instrument manufacturer's specifications using certified calibration solutions.

Groundwater was purged using an adjustable rate peristaltic pump along with dedicated tubing at each monitoring location. During sampling activities, the purged groundwater was continuously monitored using the multi-parameter water quality meter for pH, temperature, specific conductivity (SC), dissolved oxygen (DO), and oxidation/reduction potential (ORP), while turbidity was monitored using the Hach 2100Q turbidity meter. Well purging continued at each location until these field parameters stabilized as indicated in Appendix A of the IRSWP.

Monitoring wells GW-24, PZ-16RRR, and PZ-17RRR went dry upon purging and could not be sampled by low flow methods. These wells were purged dry and sampled upon recovery, which is the alternative approved method. Samples collected by this method typically have elevated turbidity. The final low flow purging field parameter measurements are presented in **Table 3**. Field data records for each groundwater monitoring location are attached in **Appendix A**.

Upon stabilization of groundwater parameters, groundwater samples were collected by directly filling the laboratory prepared sample bottles. A 0.45-micron pore diameter filter was used to field filter groundwater for dissolved metal analysis in accordance with the IRSWP. The samples were placed on ice and transferred to TestAmerica Laboratories, Inc. (TAL) of Buffalo, New York, under chain-of-custody for chemical analyses as summarized in **Table 4**. Copies of the chain-of-custody documents are provided in **Appendix B**. Laboratory analytical data are presented in the July 2019 Semi-Annual Status Report.

Purged groundwater from each monitoring well was collected in collapsible plastic containers, transported to the Block House building, adjacent to the Plant B groundwater treatment building, and containerized in a secured 55-gallon drum. Olin characterizes and disposes of that material in accordance with applicable regulations.

2.1.3 Surface Water Sampling

On December 4, 2018, Olin personnel collected six surface water samples from downstream to upstream from the East Ditch and South Ditch. The locations are identified as ISCO-2, PZ-16RRR, PZ-17RRR, SD-17, PZ-18R, and ISCO-1 as shown on **Figure 1**. No sample was collected at location ISCO-3 due to excessive mud trying to cross the South Ditch.

Before field activities began, a Horiba U-52 multi-parameter water quality meter and Hach 2100Q turbidity meter were properly calibrated to monitor surface water quality parameters at each location.

At each of the field locations, surface water parameter measurements (pH, temperature, SC, ORP, DO, and turbidity) were collected. Readings were collected by directly submersing the Horiba probe into the surface water until parameter stabilization. The final surface water field parameters are summarized in **Table 5**. Field data records from each surface water sample location are attached in **Appendix A**.

Filtered surface water samples (for dissolved metals analysis) were collected by submerging dedicated tubing attached to a peristaltic pump into the water column at a depth that minimized entraining floating or suspended sediment. The peristaltic pump provides positive pressure for field filtering the water through the 0.45-micron pore diameter filter for dissolved metal analysis.

Surface water samples were collected by directly filling the laboratory prepared glassware. The samples were then placed on ice for delivery to TAL of Buffalo, New York, under chain-of-custody for chemical analyses summarized in **Table 6**. Copies of the chain-of-custody documents are provided in **Appendix B**. Laboratory analytical data are presented in the July 2019 Semi-Annual Status Report.

2.1.4 Sediment Sampling

On December 4, 2018, Olin personnel collected five surface sediment samples from locations in the ditch system identified on **Table 1** and in **Figure 1**. The samples were collected from zero to six inches below grade using a stainless-steel hand auger. Sediments were mixed in a stainless-steel bowl using a stainless-steel spoon and placed in the sample containers provided by TAL. The samples were then placed on ice for delivery to TAL of Buffalo, New York, under chain-of-custody for chemical analyses summarized in **Table 7**. Field data records from the sediment sampling are attached in **Appendix A**. Copies of the chain-of-custody documents are provided in **Appendix B**. Laboratory analytical data will be presented in the July 2019 Semi-Annual Status Report.





2.1.5 Data Logger Data Download

Data loggers are deployed in 10 monitoring wells and piezometers: GW-10S, GW-35S, GW-CA1, GW-76S, GW-78S, GW-CA3S, GW-CA4S, PZ-24, PZ-25, and GW-6S, to continuously monitor groundwater elevation proximate to the cap area. Wood E&IS downloaded data from the 10 data loggers, along with data from the barometric pressure data logger deployed in GW-35S. Downloaded data from the loggers are presented in the July 2019 Semi-Annual Status Report.

2.1.6 Cap Inspection

The temporary cap is composed of ten large and three small scrim reinforced polyethylene sheets of 8 mil thickness. These sheets were factory fabricated with double welded seams from smaller, narrower panels. The seams between the large sheets were field fabricated by folding and sewing the edges of the sheets together with an ultraviolet (UV)-resistant thread. The original temporary cap was installed in 2001 and consisted of a 6-mil thick sheet. Due to deterioration of the 6-mil sheet, an 8-mil thick cover was installed directly over the 6-mil cover and re-ballasted with sand bags to resist wind uplift.

Since November 2016, Olin on-site personnel have been conducting the cap inspections and integrating the inspections with the maintenance repair activities. Olin has reduced the official inspection frequency from quarterly to semi-annually with informal inspections to continue to ensure that any potential significant issues are addressed in a timely fashion. The semi-annual cap inspection and maintenance field data record is included as **Appendix C** and is summarized in the July 2019 Semi-Annual Status Report (No. 24).



3.0 Plant B monitoring program

The purpose of the Plant B groundwater sampling and analysis program is to monitor groundwater quality at select monitoring wells and conduct gauging activities to determine groundwater elevations and light non-aqueous phase liquid (LNAPL) thickness.

3.1 Scope of Work

The Fourth Quarter Plant B Monitoring Program consisted of measuring groundwater levels in 28 monitoring wells within the Plant B area, gauging LNAPL thickness in monitoring wells where LNAPL was observed, and USEPA low stress (low flow) groundwater sampling at monitoring wells: B-03, GW-13, GW-16R, GW-101, IW-6, and IW-10. Groundwater monitoring wells sampled from the Plant B Monitoring Program are listed in **Table 1** and the monitoring well locations are shown on **Figure 2**.

3.1.1 Groundwater Level Measurements and LNAPL Gauging

On November 27, 2018, Olin personnel completed a site reconnaissance of the monitoring well locations in the Plant B Monitoring Program and collected groundwater level measurements and LNAPL thickness measurements. Depth to groundwater was measured in 28 monitoring wells using a water interface probe. For wells with observed LNAPL, LNAPL thickness was measured using an oil/water interface probe. Groundwater level measurements, groundwater elevations, and LNAPL thickness measurements are summarized in **Table 8**.

3.1.2 Groundwater Sampling

6107190016

On November 27 and 28, 2018, Olin personnel sampled groundwater from monitoring wells: B-03, GW-13, GW-16R, GW-101, IW-6, and IW-10 following the 2017 USEPA low stress (low flow) groundwater sampling method.

Prior to low flow sampling, a Horiba U-52 multi-parameter water quality meter and Hach 2100Q turbidity meter were calibrated according to the instrument manufacturer's specifications using certified calibration solutions.

Groundwater was purged using an adjustable rate peristaltic pump along with dedicated tubing at the sample location. During sampling activities, the purged groundwater was continuously monitored using the Horiba U-52 multi-parameter water quality meter for pH, temperature, SC, DO, and ORP, while turbidity was monitored using the Hach 2100Q turbidity meter. Well purging continued at the sample location until these field parameters stabilized as indicated in Appendix A of the IRSWP. The final low flow purging field parameter measurements are presented in **Table 9**. Field data records for each groundwater monitoring location are attached in **Appendix A**.

Upon groundwater parameter stabilization, groundwater samples were collected by directly filling the laboratory prepared glassware. The samples were placed on ice, and were transferred to TAL of Buffalo, New York, under chain-of-custody for chemical analyses as summarized in **Table 10**. Copies of the chain-of-custody documents are provided in **Appendix B**. Laboratory analytical data will be presented in the July 2019 Semi-Annual Status Report.

Purged groundwater from sampling activities was collected in collapsible plastic containers, transported to the Block House building, adjacent to the Plant B groundwater treatment building, and containerized in a secured 55-gallon drum. Olin characterizes and disposes of that material in accordance with applicable regulations.

4.0 References

MACTEC Engineering and Consulting, Inc. (MACTEC), August 8, 2008. Final Interim Response Steps Work Plan, Olin Chemical Superfund Site, Wilmington, Massachusetts.

MACTEC, August 14, 2009. Final RI/FS Work Plan, Olin Chemical Superfund Site, Wilmington, Massachusetts.





Tables

Table 1

Groundwater, Surface Water, and Sediment Sampling Locations Slurry Wall/Cap Monitoring Program Fourth Quarter 2018 Sampling Event Olin Chemical Superfund Site Wilmington, Massachusetts

Groundwater	Surface Water	Sediment
GW-10S	ISCO1	SD-SD1 (MS/MSD)
GW-24	ISCO2	SD-SD2
GW-25	ISCO3***	SD-SD3
GW-26*	PZ-16RRR	SD-SD4
GW-34SR	PZ-17RRR	SD-SD5 (DUP)
GW-34D	PZ-18R	
GW-35S	SD-17	
GW-42S**		
GW-43SR		
GW-76S		
GW-78S		
GW-79S		
GW-201S		
GW-202S		
GW-202D		
GW-CA1		
PZ-16RRR#		
PZ-17RRR #		
PZ-18R		
PZ-24		
PZ-25		
GW-16R^		
B-03^		
GW-101^		
GW-13^		
IW-10^		
IW-6^		

Notes:

Bold - DUP/ MS/ MSD collected

- * Well removed for detention basin construction
- ** Well destroyed; Sampled MP-2 #13
- *** Could not sample
- # Piezometer replaced in South Ditch
- ^ Plant B Monitoring Well

Prepared by: CTM 04/16/2019 Checked by: SAM 04/16/2019

Table 2 Groundwater Elevations Slurry Wall/Cap Monitoring Program Fourth Quarter 2018 Sampling Event Olin Chemical Superfund Site Wilmington, Massachusetts

WELL ID	Reference Elevation	Depth to Water	Groundwater Elevation (3)	Notes	Date Measured
I.D.	(ft msl)	(ft)	(feet NGVD)		
GW-10S	89.79	7.87	81.92	TOC	11/15/2018
GW-24	83.43	1.72	81.71		11/15/2018
GW-25	85.97	4.59	81.38		11/15/2018
GW-26*	84.93	*			
GW-34D	90.36	6.51	83.85		11/15/2018
GW-34SR	89.13	5.17	83.96		11/15/2018
GW-35S	88.51	6.36	82.15		11/15/2018
GW-39^	83.64	3.79	79.85		11/28/2018
GW-42S**	84.18	**			
GW-43SR	87.86	5.66	82.20		11/28/2018
GW-55D	81.95	3.43	78.52		11/28/2018
GW-55S	81.70	3.19	78.51		11/28/2018
GW-76S	88.45	6.62	81.83	TOC	11/15/2018
GW-78S	84.89	3.76	81.13		11/14/2018
GW-79S	81.54	2.57	78.97		11/14/2018
GW-201S	83.29	3.09	80.20		11/15/2018
GW-202D	86.52	5.13	81.39		11/14/2018
GW-202S	86.97	5.71	81.26		11/14/2018
GW-CA1	88.01	6.03	81.98		11/15/2018
PZ-16RRR/IN	***	3.12			11/14/2018
PZ-16RRR/OUT (4)	***	NM			
PZ-17RRR/IN	***	2.35			11/14/2018
PZ-17RRR/OUT (4)	***	NM			
PZ-18R/IN	82.42	2.29	80.13		11/14/2018
PZ-18R/OUT (4)	82.42	NM			
PZ-24	89.43	8.00	81.43		11/14/2018
PZ-25	88.90	7.55	81.35		11/14/2018

Notes:

- (1) Measurement from top of PVC. If no PVC, measurement from TOC
- (2) Collected using a Solinst water interface probe
- (3) Groundwater Elevation = Reference Elevation Depth to Water
- (4) Reported elevation of surface water adjacent to piezometer

TOC - Water level measurement taken from Top of Casing

- * Well removed for detention basin construction
- ** Well destroyed during paving
- *** Piezometer replaced in South Ditch. Not surveyed

NGVD - National Geodetic Vertical Datum

msl - mean sea level

ft - feet

NM - not measured

^ - Well heaving

Prepared by: CTM 04/16/2019 Checked by: SAM 04/16/2019

Table 3 Final Field Parameters for Groundwater Sampling Slurry Wall/Cap Monitoring Program Fourth Quarter 2018 Sampling Event Olin Chemical Superfund Site Wilmington, Massachusetts

Quarterly Slurry Wall/Cap Mor	Quarterly Slurry Wall/Cap Piezometer Wells									
Location ID	GW-25	GW-78S	GW-79S	GW-202S	GW-202D	PZ-16RRR	PZ-17RRR	PZ-18R	PZ-24	PZ-25
Date	11/15/2018	11/14/2018	11/14/2018	11/14/2018	11/14/2018	11/14/2018	11/14/2018	11/14/2018	11/14/2018	11/14/2018
Depth to Water (ft)	4.89	3.95	2.80	5.73	5.14	Dry	Dry	2.54	8.18	7.57
Temperature (ºC)	10.09	9.10	11.14	11.74	11.46	8.92	7.48	7.78	13.41	14.30
Specific Conductivity (mS/cm*)	1.17	1.10	1.64	1.36	3.33	2.27	0.741	4.53	1.82	0.789
pH (standard units)	6.48	6.01	5.77	6.68	4.77	6.07	6.86	5.78	5.52	5.54
Dissolved Oxygen (mg/L)	0.79	8.51	0.08	0.10	0.10	11.28	4.82	0.10	5.67	0.98
Turbidity (NTU)	53.7	55.7	31.2	3.90	14.2	239	669	55.3	37.4	62.1
ORP (millivolts)	-111	59	34	60	230	-34	-47	-37	-36	78

Location ID	GW-10S	GW-24	GW-34SR	GW-34D	GW-35S	MP-2#15	GW-43SR	GW-76S	GW-201S	GW-CA-1
Date	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/28/2018	11/28/2018	11/15/2018	11/15/2018	11/15/2018
Depth to Water (ft)	7.98	Dry	5.17	6.49	6.43	Multi-port	5.66	6.64	3.28	6.03
Temperature (°C)	14.48	6.94	7.62	8.60	9.10	10.61	14.54	11.01	7.51	11.04
Specific Conductivity (mS/cm*)	0.274	0.501	0.130	0.110	1.50	0.746	0.711	0.202	3.66	0.950
pH (standard units)	4.22	6.61	6.98	5.77	7.44	5.87	5.33	5.01	6.15	7.11
Dissolved Oxygen (mg/L)	5.27	13.25	0.10	0.10	0.10	3.11	9.43	7.59	0.01	0.10
Turbidity (NTU)	0.9	75.1	2.66	63.6	12.6	70	4.20	370	65.8	1.07
ORP (millivolts)	399	-37	120	174	-152	65	167	145	125	102

Notes:

ft - feet

 $\mu S/cm$ - microSiemens per centimeter

- * mS/cm (milliSiemens per centimeter)
- $1 \mu S/cm = 0.001 mS/cm$
- mg/L milligrams per liter
- NTU nephelometric turbidity units
- ORP Oxidation/Reduction Potential
- mV millivolts
- Dry = purged dry and sampled upon recovery

Prepared by: CTM 04/16/2019 Checked by: SAM 04/16/2019

Table 4 Groundwater Laboratory Analytical Program Slurry Wall/Cap Monitoring Program Fourth Quarter 2018 Sampling Event Olin Chemical Superfund Site

Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Physical/Inorganic Parameters			
Ammonia-Nitrogen	EPA 350.1 (10-107-06-1-K)	0.10	mg/L
Chloride	EPA 300.0	0.28	mg/L
Specific Conductivity	SM18 2510B	1.0	μmhos/cm
Sulfate	EPA 300.0	0.35	mg/L
Filtered Metals			
Aluminum, filtered	SW846 6010B	60	μg/L
Chromium, filtered	SW846 6010B	1.0	μg/L

Notes:

$$\begin{split} &mg/L - milligrams \ per \ liter \\ &\mu mhos/cm - micromhos \ per \ centimeter \\ &\mu mhos/cm = \mu S/cm \ (microSiemens \ per \ centimeter) \\ &1 \ \mu S/cm = 0.001 \ mS/cm \ (milliSiemens \ per \ centimeter) \\ &\mu g/L - micrograms \ per \ liter \end{split}$$

Prepared by: CTM 04/16/2019 Checked by: SAM 04/16/2019

Table 5

Final Field Parameters for Surface Water Sampling Slurry Wall/Cap Monitoring Program Fourth Quarter 2018 Sampling Event Olin Chemical Superfund Site Wilmington, Massachusetts

Quarterly Surface Water Local	Quarterly Surface Water Locations											
Location ID	ISCO1	ISCO2	ISCO3	PZ-16RRR	PZ-17RRR	PZ-18R	SD-17					
Date	12/4/2018	12/4/2018	NS	12/4/2018	12/4/2018	12/4/2018	12/4/2018					
Depth of Water (in.)	10	5	NS	3	5	7	3					
Temperature (°C)	6.03	6.11	NS	5.70	6.20	5.98	6.19					
Specific Conductivity (mS/cm*)	0.553	0.565	NS	0.594	0.595	0.558	0.587					
					2.12							
pH (standard units)	6.59	5.63	NS	5.76	6.12	6.55	6.20					
Disastrad Organia (man/l)	F 00	10.11	NO	7.00	10.00	F F4	10.10					
Dissolved Oxygen (mg/L)	5.06	13.11	NS	7.80	12.33	5.51	12.18					
Turbidity (NTU)	58.8	0.1	NS	0.1	24.9	56.3	29.8					
Turbidity (NTO)	36.6	U. I	INO	0.1	24.9	50.5	23.0					
ORP (millivolts)	114	160	NS	146	110	110	131					

Prepared by: CTM 04/16/2019

Checked by: SAM 04/16/2019

Notes:

in. - inches

 $\mu\text{S/cm}$ - microSiemens per centimeter

* - mS/cm (milliSiemens per centimeter)

 $1 \mu S/cm = 0.001 mS/cm$

mg/L - milligrams per liter

NTU - nephelometric turbidity units

ORP - Oxidation/Reduction Potential

mV - millivolts

NS - Not able to collect sample

Table 6 Surface Water Analytical Program Slurry Wall/Cap Monitoring Program Fourth Quarter 2018 Sampling Event Olin Chemical Superfund Site Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Physical/Inorganic Parameters			
Ammonia-Nitrogen	EPA 350.1 (10-107-06-1-K)	0.10	mg/L
Nitrate	EPA 300.0	0.02	mg/L
Nitrite	EPA 300.0	0.02	mg/L
Chloride	EPA 300.0	0.28	mg/L
Specific Conductivity	SM18 2510B	1.0	μmhos/cm
Sulfate	EPA 300.0	0.35	mg/L
Total Metals			
Aluminum, Total	SW846 6010B	60	μg/L
Chromium, Total	SW846 6010B	1.0	μg/L
Sodium, Total	SW846 6010B	320	μg/L
Filtered Metals			
Aluminum, Filtered	SW846 6010B	60	μg/L
Chromium, Filtered	SW846 6010B	1.0	μg/L
Sodium, Filtered	SW846 6010B	320	μg/L

Prepared by: CTM 04/16/2019

Checked by: SAM 04/16/2019

Notes: mg/L - milligrams per liter μ mhos/cm - micromhos per centimeter μ mhos/cm = μ S/cm (microSiemens per centimeter) 1 μ S/cm = 0.001 mS/cm (milliSiemens per centimeter)

μg/L - micrograms per liter

Table 7 Sediment Analytical Program Slurry Wall/Cap Monitoring Program Fourth Quarter 2018 Sampling Event Olin Chemical Superfund Site Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Physical/Inorganic Parameters			
Percent Moisture	EPA 160.3	1.0	Percent
Metals			
Aluminum	SW846 6010B	6.2	mg/Kg
Chromium	SW846 6010B	0.28	mg/Kg
Iron	SW846 6010B	5.1	mg/Kg

Notes: mg/Kg - milligrams per kilogram Prepared by: CTM 04/16/2019 Checked by: SAM 04/16/2019

Table 8 Groundwater Elevations Plant B Monitoring Program Fourth Quarter 2018 Sampling Event Olin Chemical Superfund Site Wilmington, Massachusetts

WELL ID	Reference	Depth to	Depth to	Product Thickness	Groundwater	Date
WELLID	Elevation (1)	Water (2)	Product (3)	(4)	Elevation (5)	Measured
I.D.	(ft msl)	(ft)	(ft)	(ft)	(feet NGVD)	
B-2	90.48	10.28	NPD	NA	80.20	11/27/2018
B-3	90.32	9.57	NPD	NA	80.75	11/27/2018
B-5R	91.38	9.21	NPD	NA	82.17	11/27/2018
B-7A	88.81	6.01	NPD	NA	82.80	11/27/2018
B-17	91.55	7.31	NPD	NA	84.24	11/27/2018
GW-13	90.57	10.37	NPD	NA	80.20	11/27/2018
GW-14	88.70	6.53	NPD	NA	82.17	11/27/2018
GW-15	90.01	5.83	NPD	NA	84.18	11/27/2018
GW-16R	92.46	8.61	NPD	NA	83.85	11/27/2018
GW-23	91.04	11.26	11.23	0.03	79.81	11/27/2018
GW-52S	87.95	5.83	NPD	NA	82.12	11/27/2018
GW-100	90.15	10.56	NPD	NA	79.59	11/27/2018
GW-101	90.14	10.48	NPD	NA	79.66	11/27/2018
GW-102	89.00	9.28	NPD	NA	79.72	11/27/2018
IW-1	90.71	10.03	NPD	NA	80.68	11/27/2018
IW-2	90.53	10.40	NPD	NA	80.13	11/27/2018
IW-3	90.76	10.55	10.54	0.01	80.22	11/27/2018
IW-6	89.15	9.81	NPD	NA	79.34	11/27/2018
IW-7	90.10	10.44	NPD	NA	79.66	11/27/2018
IW-8	89.94	10.18	10.17	0.01	79.77	11/27/2018
IW-9	89.78	9.87	NPD	NA	79.91	11/27/2018
IW-10	90.43	10.41	NPD	NA	80.02	11/27/2018
IW-11	89.92	10.11	10.09	0.02	79.83	11/27/2018
IW-12	90.31	10.69	NPD	NA	79.62	11/27/2018
IW-13	89.90	9.87	NPD	NA	80.03	11/27/2018
PID	89.97	10.20	NPD	NA	79.77	11/27/2018
P5	90.45	11.77	11.75	0.02	78.70	11/27/2018
12-IN	89.84	9.66	9.66	<0.01	80.18	11/27/2018

Prepared by: CTM 04/16/2019

Checked by: SAM 04/16/2019

Notes:

(1) - Reference elevations surveyed 11/97. New TOC survey by Dana Perkins 4-5/98

(2) - Top of PVC. If no PVC, measurement from top of steel casing

(3) - Collected using a Solinst water interface probe or Geotech oil/water interface probe

(4) - If sheen is noted, a product thickness of 0.01 feet will be used to calculate the groundwater elevation

(5) - Groundwater Elevation = Reference Elevation - (Depth to Water - (Product Thickness x 0.95))

TOC - Top of Casing

NPD - No Product Detected

NA - Not Applicable

NGVD - National Geodetic Vertical Datum

msl - mean sea level

ft - feet

East Ditch - No sheen noted; Observed OK

Table 9

Final Field Parameters for Groundwater Sampling Plant B Monitoring Program Fourth Quarter 2018 Sampling Event Olin Chemical Superfund Site Wilmington, Massachusetts

Quarterly Plant B Monitoring \	Vells
Location ID	GW-16R
Date	11/28/2018
Depth to Water (ft)	8.95
Temperature (°C)	12.39
Specific Conductivity (mS/cm*)	0.175
pH (standard units)	7.09
Dissolved oxygen (mg/L)	5.21
Turbidity (NTU)	27.4
ORP (millivolts)	5

Annual Plant B Monitoring Wells												
Location ID	B-03	GW-13	GW-101	IW-6	IW-10							
Date	11/28/2018	11/28/2018	11/27/2018	11/27/2018	11/27/2018							
Depth to Water (ft)	9.58	10.77	10.50	9.93	10.57							
Temperature (°C)	12.22	11.25	12.02	14.31	10.74							
Specific Conductivity (mS/cm*)	0.126	0.076	0.513	1.88	0.702							
pH (standard units)	5.45	4.81	5.77	6.45	8.04							
Dissolved oxygen (mg/L)	9.62	23.7 (%)	0.02	5.91	0.25							
Turbidity (NTU)	2.01	3.88	2.43	215	55.6							
ORP (millivolts)	313	293	-45	-81	2							

Prepared by: CTM 04/16/2019

Checked by: SAM 04/16/2019

Notes:

ft - feet

 $\mu\text{S/cm}$ - microSiemens per centimeter

* - mS/cm (milliSiemens per centimeter)

 $1 \mu S/cm = 0.001 mS/cm$

mg/L - milligrams per liter

NTU - nephelometric turbidity units

ORP - Oxidation/Reduction Potential

mV - millivolts

Table 10 Groundwater Laboratory Analytical Program Plant B Monitoring Program Fourth Quarter 2018 Sampling Event Olin Chemical Superfund Site Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Volatile organic compounds (VOC)			
2,4,4-Trimethyl-1-pentene	SW846 8260B	0.40	μg/L
2,4,4-Trimethyl-2-pentene	SW846 8260B	0.43	μg/L
Semivolatile organic compounds (SVOC)			
N-nitrosodiphenylamine	SW846 8270C	0.07	μg/L
bis(2-ethylhexyl)phthalate	SW846 8270C	0.44	μg/L
Volatile Petroleum Hydrocarbons (VPH)			
C5-C8 Aliphatics	MA VPH	1.5	μg/L
C5-C8 Aliphatics, Unadjusted	MA VPH	1.5	μg/L
C9-C12 Aliphatics	MA VPH	1.5	μg/L
C9-C12 Aliphatics, Unadjusted	MA VPH	1.5	μg/L
C9-C10 Aromatics	MA VPH	0.5	μg/L
Methyl-tert-butyl-ether (MTBE)	MA VPH	0.25	μg/L
Benzene	MA VPH	0.25	μg/L
Ethylbenzene	MA VPH	0.25	μg/L
m,p-Xylene	MA VPH	0.50	μg/L
o-Xylene	MA VPH	0.25	μg/L
Toluene	MA VPH	0.25	μg/L
Naphthalene	MA VPH	0.25	μg/L
Physical/Inorganic Parameters			·
Ammonia Nitrogon	EPA 350.1	0.10	ma/l
Ammonia-Nitrogen	(10-107-06-1-K)	0.10	mg/L
рН	SM 4500 H+ B	0.10	SU
Filtered Metals			
Iron, Filtered	SW846 6010B	19	μg/L

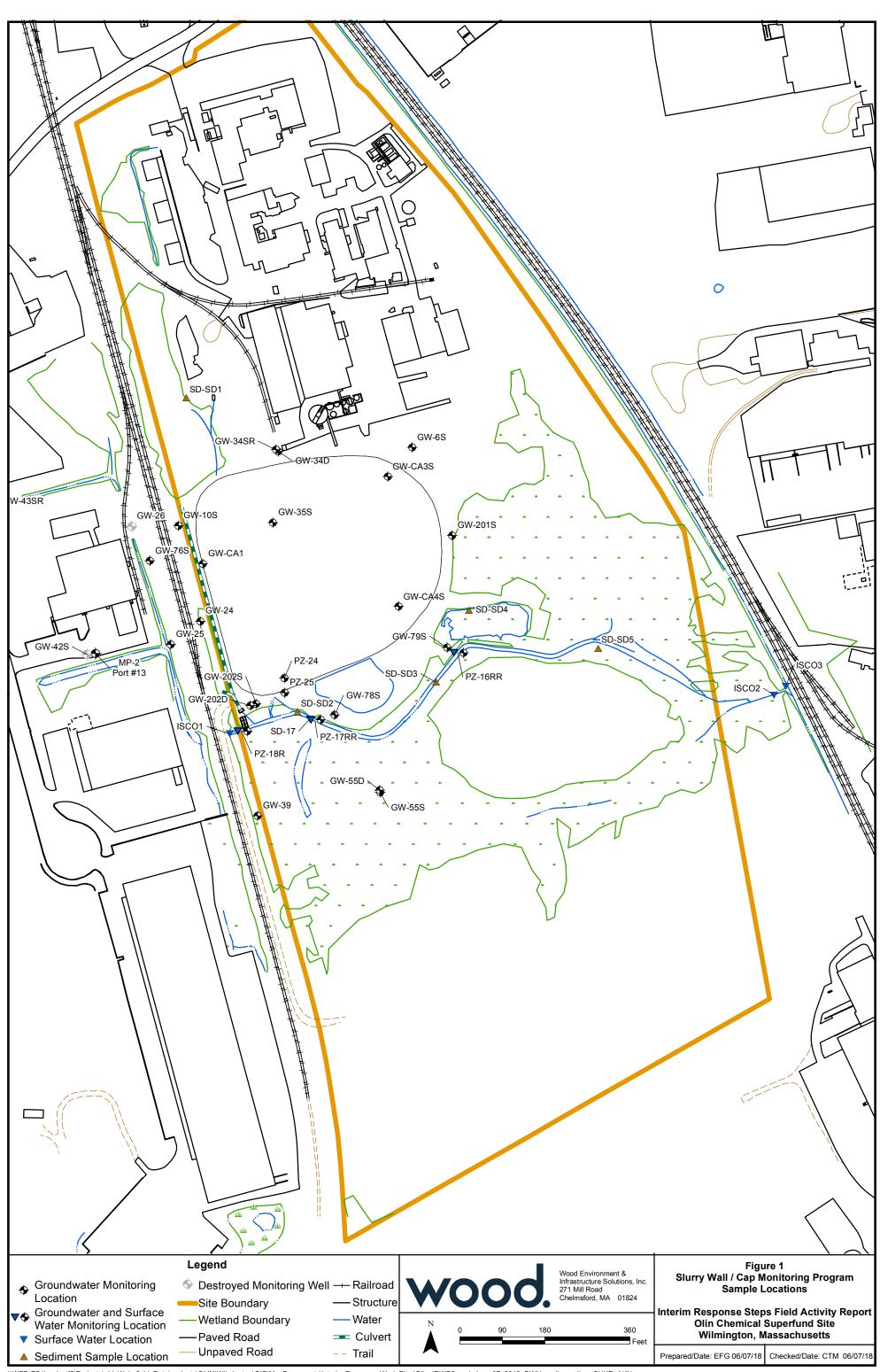
Notes:

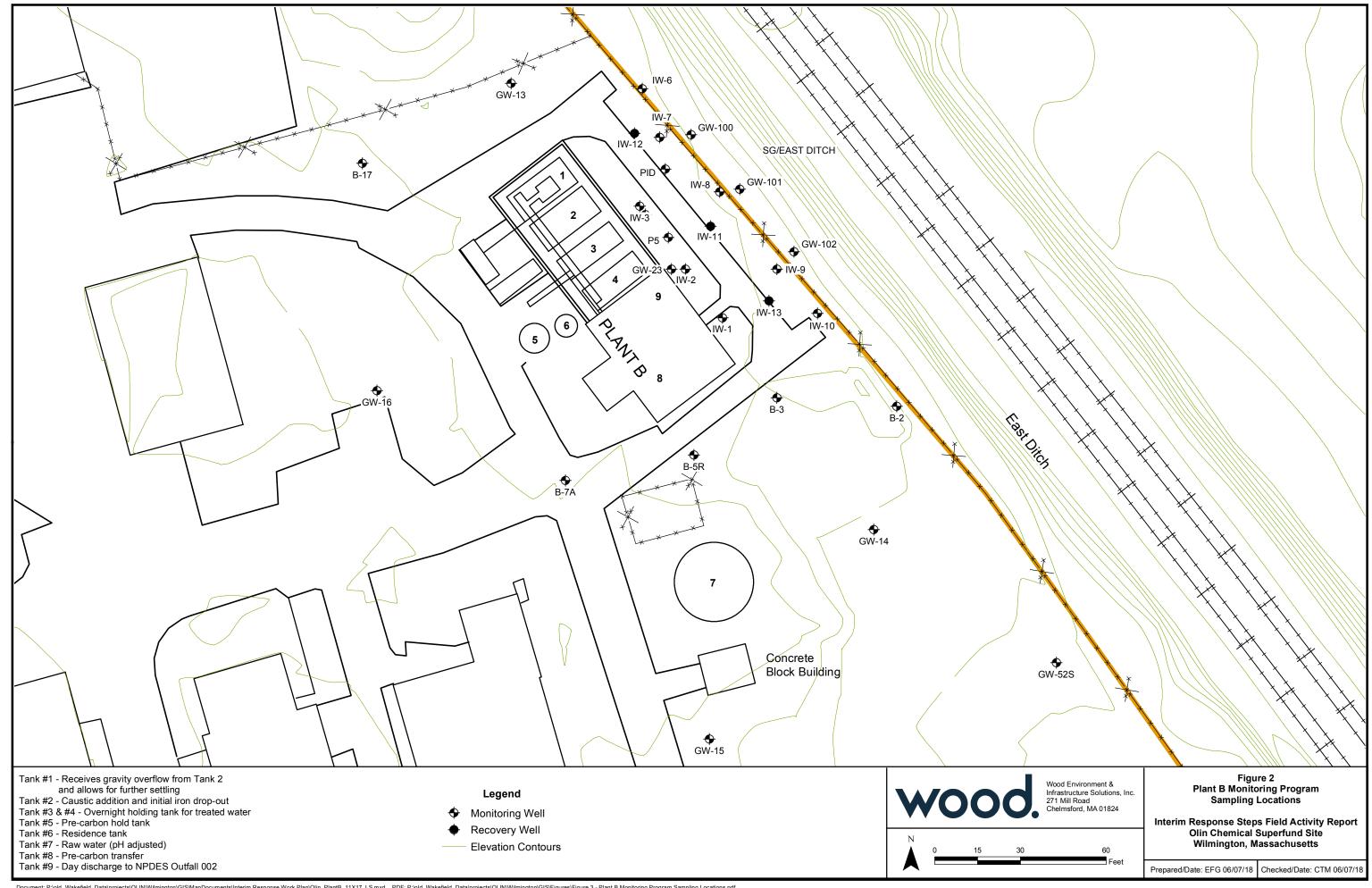
 $\label{eq:mg/L} \begin{array}{l} \mu g/L \text{ - micrograms per liter} \\ mg/L \text{ - milligrams per liter} \\ SU \text{ - standard units} \end{array}$

Prepared by: CTM 04/16/2019 Checked by: SAM 04/16/2019

wood.

Figures





wood.

Appendix A

Field Data Records and Field Instrument Calibration Records

			UCTURE SOLU W FLOW GI	•	TER SAI	MPLING					
PROJECT	OLIN CHEMIC	AL SUPERFUND	SITE, WILMINGTO	N, MA	WEL	LL ID	GW-10S]	ROUND N	IO. 4
SAMPLE ID		OC-GW-10	S		SITE T	YPE	Superfund]	DATE 11/15/2018	
TIME	START	7:40 END	8:30		JOB NUMB	ER	6107190016			BOTTLE TIME	8:20
QC SAM	EVEL / PUMP S MPLE CTED ID	SETTINGS N/A	TOP	EMENT POINT OF WELL RISER OF PROTECTIVE		PROTECTIVE CASING STIC (FROM GRO	CKUP	FT.	PROTECTIVE CASING / WELL DIFFERENCE N/A F		FT.
INITIAL DE TO WA		7.87 F	T. WELL DE	9.12	FT.	PID AMBIENT AIF	R N/A	PPM	WELL DIAMETI	ER 1.5	IN.
FINAL DE TO WA		7.98 F	` ′		FT.	PID WELL MOUTH	N/A	PPM	WELL INTEGR	YES	NO N/A
DRAWDO VOLU (final - i	IME .	<0.01 G/ch} or x 0.65 {4-inc		OF DRAWDOWN OTAL VOLUME PL		PRESSURE TO PUMP	N/A	PSI]	ITY: CAP X CASING X LOCKED X COLLAR X	$\equiv \equiv$
TOTAL \ PUR((purge r	GED	1.25 GA r minute) x time du	AL. uration (minutes) x 0	<0.01 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHAI TIMER SETTING	N/A	SEC.
PURGE D	ATA										
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMME	NTS
7:45	7.98	120	22.82	0.231	4.57	7.09	3.0	324	~ 9 ft.		
7:50	7.98	120	21.62	0.243	4.46	6.16	3.2	341			
7:55 8:00	7.98 7.98	120 120	17.00 15.91	0.258 0.263	4.32 4.24	6.18 6.01	1.9 1.3	360 376			
8:05	7.98	120	15.22	0.268	4.21	5.60	0.9	388			
8:10	7.98	120	14.69	0.271	4.20	5.36	0.8	394			
8:15	7.98	120	14.51	0.273	4.21	5.32	0.7	399			
8:20	7.98 Collect	120 Sample	14.48	0.274	4.22	5.27	0.9	399			
TYPE C	NT DOCUMEN DE PUMP ED BLADDER MCO BLADDER EOPUMP		TYPE OF TUBING TEFLON OR HIGH DENSIT X LDPE (Dedica	TEFLON LINED TY POLYETHYLEN	NE	POL	F PUMP MATERIAL LYVINYL CHLORIDE NINLESS STEEL CON (Dedicated)	=		TYPE OF BLADDE TEFLON OTHER	R MATERIAL
ANALYTIC To Be Collected	CAL PARAMET	ERS	MET NUM			ESERVATION THOD	VOLUME REQUIRED	<u>)</u>	SAMPLE COLLECTED		
VOCs: Trimethylpentenes			C /PH 6010B 1500 H+B 07-06-1 0 0	HCL / 4 DEG. C 4 DEG. C HCL / 4 DEG. C HNO3 / 4 DEG. C 4 DEG. C H2SO4 / 4 DEG. C 4 DEG. C 4 DEG. C 4 DEG. C 4 DEG. C HNO3 / 4 DEG. C				X Chlo	OCS I Fe nonia-Nitrogen oride ate cific Conductivity		
PURGE WA		_	NUMBER OF GAL			LOCATION	SKETCH				
NOTES SIGNATURE	Chloride and Su	_	GENERATED ected in one 500mL ature on File	~ 1.2 g	<u>jal.</u>	Prepared	by: BEG by: SAM by: CTM			WO	od.

			UCTURE SOLU	ITIONS, INC. ROUNDWAT	TER SAM	/PLING					
PROJECT			SITE, WILMINGTO		WELI		GW-24		1	ROUND	NO. 4
SAMPLE ID		OC-GW-24		111, 1111	SITE TY		Superfund]]		11/15/2018
TIME	START	10:00 END			JOB NUMBE		6107190016]	BOTTLE TIME	10:15
-	EVEL / PUMP S			REMENT POINT	002.1022		0.07.000.0		1	50112211112	
QC SAM		N/A	X TOP	P OF WELL RISER P OF PROTECTIVE (HER	CASING	PROTECTIV CASING STI (FROM GRC	CKUP	FT.	PROTE CASING DIFFER	3 / WELL	FT.
INITIAL DE TO WA	TER	1.72 F	T. WELL D	EPTH ~ 11.9		PID AMBIENT AII	R N/A	PPM	WELL DIAMET	TER 1.5	IN.
FINAL DE TO WA	TER	Dry F	T. SCREEN LENGTH			PID WELL MOUTH	N/A	PPM	WELL INTEGF	YES RITY: CAP <u>X</u>	NO N/A
DRAWDO VOLU (final - i	JME	N/A G/ h} or x 0.65 {4-inc		OF DRAWDOWN VO		PRESSURE TO PUMP	N/A	PSI]	CASING X CASING X COCKED X COLLAR X X X X COLLAR X X COLLAR X	$\equiv \equiv$
TOTAL \ PUR((purge)	GED .	~0.9 GA	AL. uration (minutes) x	N/A 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHA TIMER SETTIN	N/A	SEC.
PURGE D	ATA										
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	СОММ	IENTS
10:10			6.94	0.501	6.61	13.25	75.1	-37	~ 11 ft.		
10:15		Well Dry	Sample	Recharge							
10:15	Collect	Sample									
	NT DOCUMEN		TYPE OF TUBING	1		TYPE O	F PUMP MATERIAL	•	•	TYPE OF BLADD	DER MATERIAL
SI	ED BLADDER MCO BLADDER EOPUMP		TEFLON OR HIGH DENSI X LDPE (Dedications)	TY POLYETHYLENE	Ē	STA	LYVINYL CHLORIDE AINLESS STEEL ICON (Dedicated)	Ĭ.		TEFLON OTHER	
ANALYTIC To Be Collected	CAL PARAMET	ERS		THOD		ESERVATION			SAMPLE		
				<u>IBER</u>		THOD	REQUIRED	<u>]</u>	COLLECTED	_	
SV	Cs: Trimethylpent OCs: NDPA and E		8260 8270	C	4 DE	_/4 DEG. C EG. C	3 X 40 mL 2 X 1 L AG			OCs	
VPI Dis	H solved Fe		MA ' DIS.	VPH 6010B		_ / 4 DEG. C D3 / 4 DEG. (3 X 40 mL 1 X 500 mL		VPI Dis.		
pH y Am	monia-Nitrogen			4500 H+B 07-06-1		EG. C SO4 / 4 DEG.	1 X 500 mL C 1 X 250 mL		pH	monia-Nitrogen	
x Chl	loride		300.	0	4 DE	EG. C	1 X 500 mL		x Chl	oride	
x Sul	Ifate 300.0 ecific Conductivity SM 2510B					EG. C EG. C	1 X 500 mL 1 X 500 mL		x Sul	fate ecific Conductivity	
x Dis	solved AI, Cr		DIS.	6010B	HNC	O3 / 4 DEG. (1 X 500 mL		x Dis.	. Al, Cr	
PURGE O	BSERVATIONS	 S				LOCATION	I SKETCH				
PURGE WA			NUMBER OF GAL GENERATED	LONS - 0.9 ga	<u>l.</u>						
NOTES	Chloride and Sul	Ifate analysis colle	ected in one 500ml	_ bottle							
	Well went dry; sa					Sample	d by: BEG			3470	2
						Prepare	d by: SAM			WC	od.
SIGNATURE	E: Fiel	d Form w/ Signa	ature on File			Checked	by: CTM				

			W FLOW GI	-	ER SAI	MPLING					
PROJECT	OLIN CHEMIC	AL SUPERFUND	SITE, WILMINGTO	N, MA	WEI	LL ID	GW-25]	ROUND N	NO. 4
SAMPLE ID		OC-GW-2	5		SITE T	ГҮРЕ	Superfund			DATE 1	1/15/2018
TIME	START	9:15 ENI	D 9:50		JOB NUMB	BER	6107190016			BOTTLE TIME	9:40
QC SAM	EVEL / PUMP S MPLE CTED ID	N/A	X TOF	EMENT POINT OF WELL RISER OF PROTECTIVE	CASING	PROTECTIVE CASING STIC (FROM GROU	KUP	FT.	PROTEC CASING DIFFERE	/ WELL	FT.
INITIAL DE TO WA		4.59 F	T. WELL DE		FT.	PID AMBIENT AIR	,	PPM	WELL DIAMETE	ER 1.5	IN.
FINAL DE TO WA		4.89 F	T. SCREEN LENGTH		FT.	PID WELL MOUTH	N/A	PPM	WELL	YES	NO N/A
DRAWDO VOLU (final - i	JME	0.03 G/ sh} or x 0.65 {4-inc		OF DRAWDOWN VO		PRESSURE TO PUMP	N/A	PSI]	TY: CAP X CASING X LOCKED X COLLAR X	$\equiv \equiv$
TOTAL \ PUR((purge i	GED		AL. uration (minutes) x (0.03 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHAF TIMER SETTING	N/A	SEC.
PURGE D											
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	СОММЕ	:NTS
9:20	4.85	125	8.73	1.01	6.32	3.28	77.5	118	~ 11 ft.		
9:25 9:30	4.89 4.89	125 125	9.37	1.18 1.19	6.27 6.46	0.85	70.2 60.9	-25 -99			
9:35	4.89	125	10.07	1.17	6.48	0.78	57.1	-107			
9:40	4.89	125	10.09	1.17	6.48	0.79	53.7	-111			
	Collect	Sample									
						1					
TYPE C	NT DOCUMEN DE PUMP ED BLADDER MCO BLADDER EOPUMP		TYPE OF TUBING TEFLON OR HIGH DENSIT X LDPE (Dedica	Y POLYETHYLENE	:	POL STA	PUMP MATERIAL YVINYL CHLORIDE INLESS STEEL CON (Dedicated)			TYPE OF BLADDE	ER MATERIAL
ANALYTIC To Be Collected	CAL PARAMET	ERS	MET <u>NUM</u>			RESERVATION ETHOD	VOLUME REQUIRED		SAMPLE COLLECTED		
SVC VPI Diss pH X Am X Chl X Sul X Spe X Diss	VOCs: Trimethylpentenes 8260 B SVOCs: NDPA and BEHP 8270 C VPH MA VPH Dissolved Fe DIS. 6010B pH SM 4500 H+B X Ammonia-Nitrogen 10-107-06-1 X Sulfate 300.0 X Specific Conductivity SM 2510B X Dissolved AI, Cr DIS. 6010B			C /PH 6010B 500 H+B)7-06-1))	4 E HC HN 4 E 4 E 4 E 4 E	CL / 4 DEG. C DEG. C DEG. C OL / 4 DEG. C JOS / 4 DEG. C DEG. C DEG. C DEG. C DEG. C DEG. C	1 X 500 mL C 1 X 250 mL 1 X 125 mL 1 X 125 mL 1 X 125 mL 1 X 250 mL		X Chlo	Cs Fe nonia-Nitrogen ride ate ific Conductivity	
PURGE WA		_	NUMBER OF GALI			LOCATION	SKETCH				
NOTES SIGNATURE	Chloride and Su	1	GENERATED ected in one 500mL	~ 0.8 ga	<u>I.</u>	Sampled Prepared Checked	by: SAM			Wo	od.

			UCTURE SOLU W FLOW G	TIONS, INC. ROUNDWA	TER SA	MPLING						
PROJECT	OLIN CHEMICA	AL SUPERFUND S	SITE, WILMINGTO	N, MA	WEL	L ID	GW-34SR]	ROUND I	NO. 4	
SAMPLE ID		OC-GW-34S	SR		SITE T	YPE	Superfund]	DATE 1	1/15/2018	
TIME	START	10:05 ENI	11:05		JOB NUMB	IUMBER 6107190016]	BOTTLE TIME	10:55	
QC SAN	EVEL / PUMP \$ MPLE CTED ID	SETTINGS N/A	X TOP						CASING	PROTECTIVE CASING / WELL DIFFERENCE N/A FT.		
INITIAL DEI TO WA		5.17 F	T. WELL DE	PTH ~ 17.04	FT.	PID AMBIENT AIR	R N/A	DDM	WELL DIAMET	ER 2	IN.	
FINAL DEI		5.17 F	T. SCREEN			PID WELL	N/A	PPM	WELL	YES	NO N/A	
DRAWDO VOLU (final - ir	ME <	<0.01 G/h} or x 0.65 {4-inc		10 DF DRAWDOWN VO DTAL VOLUME PUF		MOUTH PRESSURE TO PUMP	N/A	PPM] INTEGR	TY: CAP	= =	
TOTAL V PURO (purge r	GED	2.34 G/ r minute) x time du	AL. uration (minutes) x	<0.01 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHA TIMER SETTING	N/A	SEC.	
PURGE DA	ATA											
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMI	ENTS	
10:10	5.17	180	6.51	0.160	8.59	0.10	24.1	-42	~ 15 ft.			
10:15	5.17	180	6.68	0.150	8.38	0.10	8.58	29				
10:20	5.17	180	6.90	0.150	7.86	0.10	7.72	61				
10:25 10:30	5.17 5.17	180 180	6.99 7.11	0.140	7.63 7.46	0.10	4.97 5.34	75 85				
10:35	5.17	180	7.11	0.140	7.40	0.10	5.17	95				
10:40	5.17	180	7.40	0.130	7.13	0.10	4.42	110				
10:45	5.17	180	7.49	0.130	6.98	0.10	2.70	111				
10:50	5.17	180	7.56	0.130	6.96	0.10	2.81	116				
10:55	5.17	180	7.62	0.130	6.98	0.10	2.66	120				
	Collect	Sample										
TYPE O	NT DOCUMEN' OF PUMP OF BLADDER OF BLADDER OF BLADDER OF BLADDER	TATION		- TEFLON LINED TY POLYETHYLEN	E	POL STA	F PUMP MATERIAL YVINYL CHLORIDE INLESS STEEL CON (Dedicated)			TYPE OF BLADD TEFLON OTHER	ER MATERIAL	
ANALYTIC To Be Collected	CAL PARAMET	ERS	METI			ESERVATION	VOLUME REQUIRED		SAMPLE			
NUMBER			B C PH 6010B 500 H+B 77-06-1	METHOD HCL / 4 DEG. C 4 DEG. C HCL / 4 DEG. C HNO3 / 4 DEG. C HNO3 / 4 DEG. C HNO3 / 4 DEG. C				X Chlo	Cs CCs I Fe monia-Nitrogen oride iate cific Conductivity			
PURGE OI PURGE WA CONTAINER		<u>_</u>	NUMBER OF GAL GENERATED	.LONS ~ 2.3 ga	I	LOCATION	SKETCH					
NOTES						Sampled Prepared Checked	by: SAM			WC	od	

			UCTURE SOLU W FLOW G	ITIONS, INC. ROUNDWA	TER SA	MPLING					
PROJECT	OLIN CHEMICA	AL SUPERFUND S	SITE, WILMINGTO	N, MA	WEL	L ID	GW-34D			ROUND	NO. 4
SAMPLE ID		OC-GW-34I	D		SITE T	YPE	Superfund			DATE	11/15/2018
TIME	START	11:10 END	11:55		JOB NUMB	ER	6107190016]	BOTTLE TIME	11:40
QC SAN	EVEL / PUMP S	SETTINGS N/A	X TOP	EMENT POINT OF WELL RISER OF PROTECTIVE	CASING	PROTECTIVI CASING STIG (FROM GRO	CKUP	FT.	PROTEC CASING DIFFER	/ WELL	FT.
INITIAL DEI TO WA		6.51 F	T. WELL DE			PID	NI/A	DDM	WELL	FD 0	
FINAL DEI		6.49 F			FT.	AMBIENT AIR		PPM	DIAMETI	YES	NO N/A
DRAWDO VOLU (final - ir	ME <	<0.01 GA		10 DF DRAWDOWN VO DTAL VOLUME PUF		MOUTH PRESSURE TO PUMP	N/A	PPM] INTEGR	TY: CAP	<u>x</u> <u></u>
TOTAL V PURO (purge r	GED	1.25 GA r minute) x time du	AL. uration (minutes) x	<0.01 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHAI TIMER SETTING	N/A	SEC.
PURGE DA	ATA										
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMM	1ENTS
11:10	6.49	150	7.42	0.190	7.68	0.10	3.70	33	~ 32 ft.		
11:15	6.49	160	6.88	0.180	6.61	0.10	69.3	117			
11:20	6.49 6.49	160	7.29	0.130	6.08	0.10	68.4	143			
11:25 11:30	6.49	160 160	8.10 8.35	0.120	5.88 5.77	0.10 0.10	67.1 65.5	163 171			
11:35	6.49	160	8.52	0.110	5.76	0.10	63.9	172			
11:40	6.49	160	8.60	0.110	5.77	0.10	63.6	174			
	Collect	Sample									
TYPE O	NT DOCUMEN OF PUMP ED BLADDER OF BLADDER OF BLADDER OF BLADDER			- TEFLON LINED TY POLYETHYLEN	E	POI	F PUMP MATERIAL LYVINYL CHLORIDE NINLESS STEEL CON (Dedicated)			TYPE OF BLADE TEFLON OTHER	DER MATERIAL
ANALYTIC To Be Collected	CAL PARAMET	ERS				ESERVATION THOD	VOLUME REQUIRED		SAMPLE COLLECTED		
SVC VPH Diss pH X Ami X Chli X Sult	Be Collected METHOD NUMBER			C PH 6010B 500 H+B 07-06-1 0	METHOD HCL / 4 DEG. C 4 DEG. C 2 HCL / 4 DEG. C 3 HNO3 / 4 DEG. C 1 HB 4 DEG. C 1 H2SO4 / 4 DEG. C 1 DEG. C 4 DEG. C 1 DEG. C				X Chlo	OCs I Fe monia-Nitrogen oride ate cific Conductivity	
PURGE WA	URGE OBSERVATIONS JRGE WATER NUMBER OF GALLONS ONTAINERIZED YES NO GENERATED ~ 1.3 gal.						I SKETCH				
NOTES SIGNATURE	OTES Chloride and Sulfate analysis collected in one 500mL bottle						l by: LJ l by: SAM l by: CTM			W	ood.

		· & INFRASTRI CORD - LO		ITIONS, INC.	ATER SAI	MPLING					
PROJECT	OLIN CHEMICA	AL SUPERFUND S	SITE, WILMINGTO	N, MA	WEL	L ID	GW-35S]	ROUND I	NO. 4
SAMPLE ID		OC-GW-35	S		SITE T	YPE	Superfund]	DATE 1	1/15/2018
TIME	START	9:10 END	10:00		JOB NUMBE	ER	6107190016]	BOTTLE TIME	9:50
QC SAN	EVEL / PUMP S	SETTINGS N/A	X TOP	REMENT POINT P OF WELL RISER OF PROTECTIVE		PROTECTIVE CASING STIC (FROM GROU	KUP	FT.	PROTEC CASING DIFFERE	/ WELL	FT.
INITIAL DE TO WA		6.36 F	T. WELL DE	EPTH ~ 19.51		PID AMBIENT AIR	N/A	PPM	WELL DIAMETE	ER 2	IN.
FINAL DE TO WA		6.43 F	, ,			PID WELL MOUTH	N/A	PPM	WELL INTEGRI	YES	NO N/A
DRAWDO VOLU (final - i	JME	0.01 GA	AL. RATIO	OF DRAWDOWN \	VOLUME	PRESSURE TO PUMP	N/A	PSI]	TY: CAP X CASING X LOCKED X COLLAR X	
TOTAL \ PUR((purge)	GED	1.66 GA r minute) x time du		<0.01 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHAF TIMER SETTING	N/A	SEC.
PURGE D	ATA										
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMME	ENTS
9:15	6.43	160	8.03	1.44	7.98	0.10	60.4	-109	~ 17 ft.		
9:20	6.43	160	8.76	1.45	7.95	0.10	32.9	-119			
9:25 9:30	6.43	160 160	9.00	1.46 1.48	7.78 7.59	0.10 0.10	19.6 14.6	-120 -110			
9:35	6.43	160	9.11	1.48	7.59	0.10	12.8	-136			
9:40	6.43	160	9.11	1.47	7.50	0.10	12.5	-146			
9:45	6.43	160	9.09	1.49	7.45	0.10	13.3	-150			
9:50	6.43	160	9.10	1.50	7.44	0.10	12.6	-152			
	Collect	Sample									
TYPE C	NT DOCUMEN' DE PUMP ED BLADDER MCO BLADDER EOPUMP	_	TYPE OF TUBING TEFLON OR HIGH DENSI X LDPE (Dedic	TEFLON LINED	NE	POL STA	F PUMP MATERIAL YVINYL CHLORIDE INLESS STEEL CON (Dedicated)	:		TYPE OF BLADD	ER MATERIAL
ANALYTIC To Be Collected	CAL PARAMET	ERS				ESERVATION THOD	VOLUME REQUIRED	1	SAMPLE COLLECTED		
SVC VPI Diss pH X Am X Chl X Sul X Spe	NUMBER VOCs: Trimethylpentenes 8260 B SVOCs: NDPA and BEHP 8270 C VPH MA VPH Dissolved Fe DIS. 6010B				METHOD REQUIRED HCL / 4 DEG. C 3 X 40 mL 4 DEG. C 2 X 1 L AG HCL / 4 DEG. C 3 X 40 mL HNO3 / 4 DEG. C 1 X 500 mL HNO3 / 4 DEG. C 1 X 500 mL				X Chlo	CS Fe nonia-Nitrogen vride ate cific Conductivity	
PURGE WA	TER	_	NUMBER OF GAI	LLONS		LOCATION	SKETCH				
NOTES	NTAINERIZED YES NO GENERATED ~1.7 gal.						by: LJ by: SAM by: CTM			WC	od.

			W FLOW G	ITIONS, INC. ROUNDWA	TER SA	MPLING					
PROJECT	OLIN CHEMICA	AL SUPERFUND S	SITE, WILMINGTON	N, MA	WEL	L ID	GW-43SR			ROU	ND NO. 4
SAMPLE ID		OC-GW-43S	iR		SITE T	YPE	Superfund			DATE	11/28/2018
TIME	START	8:10 END	9:05		JOB NUMBE	ER	6107190016			BOTTLE TIME	8:40
QC SAM		SETTINGS OUP/MS/MSD	X TOP	EMENT POINT OF WELL RISER OF PROTECTIVE ER	CASING	PROTECTIVE CASING STIC (FROM GRO	CKUP	FT.	PROTEC CASING DIFFERI	/ WELL	I/A FT.
INITIAL DEF TO WAT		5.66 F1	T. WELL DE (TOR)	PTH ~ 17.4	FT.	PID AMBIENT AIF	R N/A	PPM	WELL DIAMET	ER 2	IN.
FINAL DEF		5.66 F1	` '		FT.	PID WELL MOUTH	N/A	PPM	WELL	YI	ES NO N/A
DRAWDO VOLU (final - ir	ME .	<0.01 GA	AL. RATIO C	OF DRAWDOWN VO	OLUME	PRESSURE TO PUMP	N/A	PSI]	CASING LOCKED COLLAR	<u>X</u>
TOTAL V PURG (purge r	GED	1.72 GA r minute) x time du	AL. uration (minutes) x	<0.01 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHA TIMER SETTING	N/A	A SEC.
PURGE DA											
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	СО	MMENTS
8:15	5.66	220	17.22	0.757	5.41	15.36	62.5	211	~ 16 ft.		
8:20	5.66	220	15.24	0.759	5.39	11.53	52.2	187			
8:25 8:30	30 5.66 220		15.01 14.62	0.719 0.710	5.34 5.33	10.20 9.52	32.1 4.91	173 165			
8:35			14.58	0.710	5.33	9.47	4.91	166			
8:40	5.66	220	14.54	0.711	5.33	9.43	4.20	167			
	Collect	Sample									
					 						
					+						
					+						
					 						
TYPE 0 QE SIM	NT DOCUMEN OF PUMP OF BLADDER OF BLADDER OF BLADDER OF BLADDER	: [[TEFLON LINED TY POLYETHYLEN	IE	POL STA	F PUMP MATERIAL YVINYL CHLORIDE INLESS STEEL CON (Dedicated)			TYPE OF BLA	
ANALYTIC To Be Collected		ERS				ESERVATION			SAMPLE COLLECTED		
SVC VPH Diss pH X Amr X Chlo X Sulf	NUMBER			B C PH 6010B 500 H+B 17-06-1	METHOD REQUIRE HCL / 4 DEG. C 3 X 40 mL 4 DEG. C 2 X 1 L AG HCL / 4 DEG. C 3 X 40 mL HNO3 / 4 DEG. C 1 X 500 m				VOC SVC VPH Dis. pH X Amr X Chlc	Cs CCs I Fe monia-Nitrogen oride ate cific Conductivity	
PURGE OF	BSERVATION:		NUMBER OF GAL	LONS		LOCATION	SKETCH				
CONTAINER NOTES	RIZED YES	NO	GENERATED	~ 1.7 ga	<u>u</u>						
SIGNATURE	Chloride and Sulfate analysis collected in one 500mL bottle DUP/MS/MSD Collected NATURE: Field Form w/ Signature on File					Sampled by: BEG Prepared by: SAM Checked by: CTM				W	ood.

		& INFRASTRU CORD - LO		JTIONS, INC. ROUNDWA	TER SAM	MPLING					
PROJECT	OLIN CHEMICA	AL SUPERFUND S	SITE, WILMINGTO	N, MA	WELI	L ID	GW-76S]	ROUND) NO. 4
SAMPLE ID		OC-GW-769	S		SITE TY	/PE	Superfund]	DATE	11/15/2018
TIME	START	8:30 END	9:05		JOB NUMBE	ER	6107190016]	BOTTLE TIME	8:55
QC SAM	EVEL / PUMP S MPLE CTED ID	N/A	X TOP	REMENT POINT OF WELL RISER OF PROTECTIVE	CASING	PROTECTIVE CASING STIC (FROM GRO	CKUP	FT.	PROTE(CASING DIFFER	/ WELL	A FT.
INITIAL DE TO WA		6.62 FT				PID			WELL		
FINAL DE TO WA		6.64 F	(TOR) T. SCREEN	~ 15.1		AMBIENT AIF	R N/A	PPM	DIAMET WELL	ER 2 YES	IN. NO N/A
DRAWDO VOLU	OWN IME <	<0.01 GA	LENGTH		FT. OLUME	MOUTH PRESSURE TO PUMP	N/A N/A	PPM		ITY: CAP X CASING X LOCKED X COLLAR X	
TOTAL \	/OL.	1.04 GA minute) x time du	AL.	<0.01		REFILL TIMER SETTING	N/A	SEC.	DISCHA TIMER SETTING	RGE N/A	SEC.
PURGE D	ATA										
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMM	MENTS
8:35	6.64	160	11.60	0.400	5.73	13.58	344	137	~ 12 ft.		
8:40 8:45	6.64 6.64	160 160	11.38	0.215 0.205	5.38 5.12	9.30 8.25	573 401	112 133			
8:50	6.64	160	11.20	0.203	5.05	7.92	381	141			
8:55	6.64	160	11.01	0.202	5.01	7.59	370	145			
	Collect	Sample									
TYPE C	NT DOCUMEN' OF PUMP ED BLADDER MCO BLADDER EOPUMP	_	TYPE OF TUBING TEFLON OR X HIGH DENSI LDPE (Dedic	TEFLON LINED	ΙΕ	POL STA	F PUMP MATERIAL LYVINYL CHLORIDE LINLESS STEEL CON (Dedicated)			TYPE OF BLADI TEFLON OTHER	DER MATERIAL
ANALYTIC To Be Collected	CAL PARAMET	ERS	METI NUM			ESERVATION <u>FHOD</u>	VOLUME REQUIRED		SAMPLE COLLECTED	1	
SVC VPI Diss pH X Am X Chl X Sul X Spe	solved Fe monia-Nitrogen oride	3EHP	8260 8270 MA V DIS. SM 4 10-11 300.0 SM 2	B C /PH 6010B 5500 H+B 07-06-1	HCL 4 DE HCL HNC 4 DE H2S 4 DE 4 DE	./4 DEG. C EG. C ./4 DEG. C 03/4 DEG. C EG. C EG. C EG. C EG. C EG. C EG. C	3 X 40 mL 2 X 1 L AG 3 X 40 mL 1 X 500 mL			Cs CCs If Fe monia-Nitrogen oride rate cific Conductivity	
PURGE WA	URGE OBSERVATIONS URGE WATER NUMBER OF GALLONS ONTAINERIZED YES NO GENERATED ~ 1.0 gal.					LOCATION	SKETCH				
NOTES	NTAINERIZED YES NO GENERATED ~ 1.0 gal.					Prepared	by: BEG by: SAM by: CTM			W	ood.

		CORD - LO		UTIONS, INC.	ATER SA	MPLING					
PROJECT		AL SUPERFUND S			WEL		GW-78S]	ROUNE) NO. 4
SAMPLE ID		OC-GW-78	 S		SITE T		Superfund]		11/14/2018
TIME	START	9:25 END	10:00		JOB NUMBI	ER	6107190016		1	BOTTLE TIME	9:50
	EVEL / PUMP	SETTINGS	MEASU	REMENT POINT					_		
	CTED ID	N/A	TO	P OF WELL RISER P OF PROTECTIVE HER		PROTECTIVE CASING STIC (FROM GRO	CKUP	FT.	PROTE CASING DIFFER	3 / WELL	A FT.
INITIAL DE TO WA	TER	3.76 F	T. WELL D	©EPTH ~ 10.35	5 FT.	PID AMBIENT AIF	R N/A	PPM	WELL DIAMET	TER 2	IN.
FINAL DE TO WA	TER	3.95 F	T. SCREE		FT.	PID WELL MOUTH	N/A	PPM	WELL INTEGE	YES	NO N/A
DRAWDO VOLU (final - i	JME	0.03 GA ch} or x 0.65 {4-inc		OF DRAWDOWN'		PRESSURE TO PUMP	N/A	PSI]	CAP X CASING X LOCKED X COLLAR X	
TOTAL \ PUR((purge)	GED	1.11 GA er minute) x time du		0.02 x 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHA TIMER SETTIN	N/A	SEC.
PURGE D	ATA										
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMI	MENTS
9:30	3.93	170	8.89	1.08	6.27	15.04	180	-34	~ 9 ft.		
9:35	3.95	170	8.75	1.10	6.07	9.67	150	15			
9:40 9:45	3.95 3.95	170 170	9.07 9.17	1.10	6.02	8.59 8.59	63.1 59.2	55 56			
9:50	3.95	170	9.10	1.10	6.01	8.51	55.7	59			
	Collec	t Sample									
FOLUDME	NT DOCUMEN	ITATION									
TYPE C	DE PUMP ED BLADDER MCO BLADDER EOPUMP			R TEFLON LINED SITY POLYETHYLE	NE	POL	F PUMP MATERIAL LYVINYL CHLORIDE LINLESS STEEL CON (Dedicated)			TYPE OF BLAD TEFLON OTHER	DER MATERIAL
ANALYTIC To Be Collecte		TERS					VOLUME REQUIRED		SAMPLE COLLECTED	<u>)</u>	
SV(NALYTICAL PARAMETERS Be Collected METHOD NUMBER VOCs: Trimethylpentenes 8260 B SVOCs: NDPA and BEHP 8270 C VPH MA VPH Dissolved Fe DIS. 6010B pH SM 4500 H+ X Ammonia-Nitrogen 10-107-06-1 X Chloride 300.0 X Sulfate 300.0 X Specific Conductivity SM 2510B X Dissolved Al, Cr DIS. 6010B URGE OBSERVATIONS			0 B 0 C VPH . 6010B 4500 H+B 107-06-1 .0	METHOD HCL / 4 DEG. C 4 DEG. C 4 DEG. C HCL / 4 DEG. C B HN03 / 4 DEG. C H+B 4 DEG. C H2S04 / 4 DEG. C				VOI SVC VPH Dis. pH X Amn X Chl X Sul	Cs OCs H . Fe monia-Nitrogen oride fate ecific Conductivity	
PURGE WA	TER	_	NUMBER OF GA		rol l	LOCATION	SKETCH				
NOTES	NTAINERIZED YES NO GENERATED ~ 1.1 gal. OTES Chloride and Sulfate analysis collected in one 500mL bottle					Prepared	by: BEG by: SAM by: CTM			W	ood.
SIGNATURE	E: Fie	ld Form w/ Signa	ture on File		ı						

			UCTURE SOLU W FLOW G	•	TER SA	MPLING					
PROJECT	OLIN CHEMICA	AL SUPERFUND S	SITE, WILMINGTOI	N, MA	WEL	.L ID	GW-79S			ROUND	NO. 4
SAMPLE ID		OC-GW-798	S		SITE T	YPE	Superfund			DATE	11/14/2018
TIME	START	10:35 END	11:10		JOB NUMBE	ER	6107190016]	BOTTLE TIME	11:00
QC SAM	EVEL / PUMP S MPLE CTED ID	N/A	X TOP	EMENT POINT OF WELL RISER OF PROTECTIVE ER		PROTECTIVE CASING STIC (FROM GROU	KUP	FT.	PROTEG CASING DIFFER	/ WELL	FT.
INITIAL DE TO WA		2.57 F				PID	N/A	DDM	WELL	ER 2	
FINAL DE TO WA		2.80 F		~ 11.25		AMBIENT AIR		PPM	DIAMET	YES	NO N/A
DRAWDO VOLU (final - i	JME	0.03 GA h) or x 0.65 {4-incl		10 DF DRAWDOWN \ DTAL VOLUME PU		MOUTH PRESSURE TO PUMP	N/A	PPM] INTEGR	ITY: CAP X CASING X LOCKED X COLLAR X	
TOTAL \ PUR((purge i	GED	1.17 GA minute) x time du	AL. Irration (minutes) x	<0.01 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHA TIMER SETTING	N/A	SEC.
PURGE D	ATA										
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMM	1ENTS
10:40	2.79	180	10.42	1.62	6.08	0.33	87.2	40	~ 9 ft.		
10:45 10:50	2.80	180 180	11.28 11.35	1.64 1.64	5.82 5.78	0.01	29.3 29.7	38 35			
10:55	2.80	180	11.13	1.64	5.78	0.09	30.4	34			
11:00	2.80 Collect	180 Sample	11.14	1.64	5.77	0.08	31.2	34			
TYPE C	NT DOCUMEN' DE PUMP ED BLADDER MCO BLADDER EOPUMP	_	TYPE OF TUBING TEFLON OR X HIGH DENSI LDPE (Dedications)	TEFLON LINED TY POLYETHYLEN	NE	POL STAI	PUMP MATERIAL YVINYL CHLORIDE INLESS STEEL CON (Dedicated)	:		TYPE OF BLADE TEFLON OTHER	DER MATERIAL
ANALYTIC To Be Collected	CAL PARAMET	ERS				ESERVATION THOD	VOLUME REQUIRED	1	SAMPLE COLLECTED		
SVC VPI Diss pH X Am X Chl X Sul X Spe	NUMBER VOCs: Trimethylpentenes 8260 B SVOCs: NDPA and BEHP 8270 C VPH MA VPH Dissolved Fe DIS. 6010B				METHOD REQUIRE HCL / 4 DEG. C 3 X 40 mL 4 DEG. C 2 X 1 L AG HCL / 4 DEG. C 3 X 40 mL HN03 / 4 DEG. C 1 X 500 m 4 DEG. C 1 X 500 m H2SO4 / 4 DEG. C 1 X 500 m HNO3 / 4 DEG. C 1 X 500 m				X Chlo	OCs I Fe monia-Nitrogen oride ate cific Conductivity	
PURGE WA	TER	_	NUMBER OF GAL	LONS		LOCATION	SKETCH				
NOTES SIGNATURE	NTAINERIZED YES NO GENERATED ~ 1.2 gal. OTES Chloride and Sulfate analysis collected in one 500mL bottle						by: BEG by: SAM by: CTM			W	ood.

		'& INFRASTRU CORD - LOV		TIONS, INC. ROUNDWA	TER SAI	MPLING					
PROJECT	OLIN CHEMICA	AL SUPERFUND S	SITE, WILMINGTON	I, MA	WELI	L ID	GW-201S]	ROUND N	0. 4
SAMPLE ID		OC-GW-201	S		SITE TY	/PE	Superfund]	DATE 11	1/15/2018
TIME	START	10:35 END	11:05		JOB NUMBE	ER	6107190016			BOTTLE TIME	10:55
QC SAM	EVEL / PUMP S MPLE CTED ID	SETTINGS N/A	X TOP	EMENT POINT OF WELL RISER OF PROTECTIVE	CASING	PROTECTIVE CASING STIC (FROM GROU	KUP	FT.	PROTEG CASING DIFFER	/ WELL	FT.
INITIAL DE TO WA		3.09 FT		PTH ~ 14.95		PID	N/A	DDM	WELL DIAMET	ER 2	INI
FINAL DE TO WA		3.28 FT				AMBIENT AIR		PPM	WELL	YES	NO N/A
DRAWDO VOLU (final - i	JME	0.03 GA ch} or x 0.65 {4-inch		10 DF DRAWDOWN VOTAL VOLUME PUF	OLUME	MOUTH PRESSURE TO PUMP	N/A	PPM] INTEGR	ITY: CAP X CASING X LOCKED X COLLAR X	
TOTAL \ PUR((purge i	GED	0.83 GA r minute) x time du		0.03 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHA TIMER SETTING	N/A	SEC.
PURGE D	ATA										
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMME	NTS
10:40	3.28	160	6.37	3.76	6.71	3.00	74.6	83	~ 12 ft.		
10:40 10:45	3.28 3.28	160 160	7.20 7.39	3.70 3.68	6.23 6.19	0.17	74.0 73.7	116 120			
10:50	3.28	160	7.47	3.67	6.15	0.03	69.3	124			
10:55	3.28	160	7.51	3.66	6.15	0.01	65.8	125			
	Collect	Sample									
			+								
TYPE C	NT DOCUMEN' DE PUMP ED BLADDER MCO BLADDER EOPUMP	<u>.</u>	TYPE OF TUBING TEFLON OR HIGH DENSI X LDPE (Dedica	TEFLON LINED TY POLYETHYLEN	E	POL'	PUMP MATERIAL YVINYL CHLORIDE NLESS STEEL CON (Dedicated)			TYPE OF BLADDE TEFLON OTHER	R MATERIAL
	CAL PARAMET	ERS		,	PRE		VOLUME		SAMPLE		
VO SVV VPI Diss pH X Am X Chl X Sul X Spe	NUMBER VOCs: Trimethylpentenes 8260 B SVOCs: NDPA and BEHP 8270 C VPH MA VPH Dissolved Fe DIS. 6010B				PRESERVATION METHOD HCL / 4 DEG. C 3 X 40 mL 4 DEG. C 2 X 1 L AG HCL / 4 DEG. C 3 X 40 mL HNO3 / 4 DEG. C 1 X 500 ml H2SO4 / 4 DEG. C 1 X 500 ml H2SO4 / 4 DEG. C 1 X 500 ml H2SO4 / 4 DEG. C 1 X 500 ml H2SO4 / 4 DEG. C 1 X 500 ml H2SO4 / 4 DEG. C 1 X 500 ml				COLLECTED VOC SVC VPH Dis. pH X Amr X Chlc X Sulf	CS CCS I Fe nonia-Nitrogen oride ate cific Conductivity	
PURGE WA	TER	_	NUMBER OF GAL	LONS		LOCATION	SKETCH				
NOTES	NTAINERIZED YES NO GENERATED ~ 1.0 gal.						by: BEG by: SAM by: CTM			wo	od.

		& INFRASTRU CORD - LOV		-	ATER SA	MPLING					
PROJECT	OLIN CHEMICA	AL SUPERFUND S	SITE, WILMINGTO	N, MA	WEL	L ID	GW-202S]	ROUND NO.	4
SAMPLE ID		OC-GW-202	S		SITE T	YPE	Superfund]	DATE 11/14/2	2018
TIME	START	9:15 END	10:05		JOB NUMBI	ER	6107190016]	BOTTLE TIME 9:55	5
QC SAM	EVEL / PUMP S	SETTINGS N/A	X TOF	EMENT POINT OF WELL RISER OF PROTECTIVE		PROTECTIVE CASING STIC (FROM GRO	KUP	FT.	PROTEC CASING DIFFERI	/ WELL	т.
INITIAL DE TO WA		5.71 FT				PID			WELL	_	
FINAL DE TO WA		5.73 FT	(TOR) T. SCREEN	~ 13.3	FT.	AMBIENT AIR	N/A	PPM	DIAMETI WELL	YES NO	N. N/A
DRAWDO VOLU	JME <	<0.01 GA		8 OF DRAWDOWN VOTAL VOLUME PU		MOUTH PRESSURE TO PUMP	N/A N/A	PPM] INTEGR	TY:	=
TOTAL \	/OL.	1.87 GA	L.	<0.01		REFILL TIMER SETTING	N/A	SEC.	DISCHAI TIMER SETTING	RGE N/A SE	EC.
PURGE D	ATA										
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS	
9:20	5.74	180	11.59	1.36	7.11	0.10	23.9	-3	~ 11 ft.		
9:25	5.73	180	11.65	1.34	7.09	0.10	14.4	18			
9:30	5.73	180	11.67	1.34	6.95	0.10	4.75	36			
9:35 9:40	5.73 5.73	180 180	11.71 11.75	1.35 1.35	6.88	0.10	4.48 5.07	42 54			
9:45	5.73	180	11.74	1.35	6.70	0.10	4.78	57			
9:50	5.73	180	11.74	1.35	6.67	0.10	3.86	60			
9:55	5.73	180	11.74	1.36	6.68	0.10	3.90	60			
	Collect	Sample									
	NT DOCUMEN	_									
QE	DE PUMP ED BLADDER MCO BLADDER EOPUMP	: [[]		TEFLON LINED TY POLYETHYLE	NE	POL STA	F PUMP MATERIAL YVINYL CHLORIDE INLESS STEEL CON (Dedicated)	:		TYPE OF BLADDER MAT	<u>[ERIAL</u>
ANALYTIC To Be Collected	CAL PARAMET	ERS	MET <u>NU</u> M			ESERVATION THOD	VOLUME REQUIRED	ı.	SAMPLE COLLECTED		
	Cs: Trimethylpen	tenes	8260	В	НС	L / 4 DEG. C	3 X 40 mL		Voc	`e	
SVC	OCs: NDPA and E		8270	С	4 D	EG. C	2 X 1 L AG		SVC	OCs .	
VPI Dis:	H solved Fe		MA \	/PH 6010B		L / 4 DEG. C O3 / 4 DEG. C	3 X 40 mL 1 X 500 mL		VPH Dis.		
pН			SM 4	500 H+B	4 D	EG. C	1 X 500 mL		pH		
X Am	monia-Nitrogen oride		10-10 300.0	07-06-1)		SO4 / 4 DEG. (EG. C	1 X 250 mL 1 X 500 mL		X Amn	nonia-Nitrogen oride	
X Sul	fate		300.0)		EG. C EG. C	1 X 500 mL		X Sulfa	ate	
	X Specific Conductivity SM 2510B Dissolved Al, Cr DIS. 6010B						1 X 500 mL 1 X 500 mL		X Spe	cific Conductivity Al, Cr	
PURGE O	BSERVATIONS		NUMBER OF GAI	LONS		LOCATION	SKETCH				
CONTAINER	RIZED YES] NO	GENERATED	~ 1.9 g	al.						
NOTES	Chloride and Su	Ifate analysis colle	ected in one 500m	L bottle							
						Sampled by: LJ			1400	لہ	
						Prepared by: SAM				WOO	7 0.
SIGNATURE	E. Eigl	d Form w/ Signa	ture on File			Checked by: CTM					

		& INFRASTRU CORD - LO		UTIONS, INC.	ATER SA	MPLING					
PROJECT	OLIN CHEMICA	AL SUPERFUND S	SITE, WILMINGTO	DN, MA	WEL	L ID	GW-202D			ROUND NO.	4
SAMPLE ID		OC-GW-202	D		SITE T	YPE	Superfund			DATE 11/14/2	2018
TIME	START	8:05 END	9:10		JOB NUMBE	ER	6107190016]	BOTTLE TIME 8:4	5
QC SAM		SETTINGS OUP/MS/MSD	X TOF	REMENT POINT P OF WELL RISER P OF PROTECTIVE HER		PROTECTIVE CASING STIC (FROM GROU	KUP	FT.	PROTEC CASING DIFFERE	/ WELL	FT.
INITIAL DE TO WA		5.13 F		EPTH ~ 23.7	FT.	PID AMBIENT AIR	N/A	PPM	WELL	ER 2 1	IN.
FINAL DE TO WA		5.14 F		1		PID WELL			WELL	YES NO	
DRAWDO VOLU (final - i	JME <	<0.01 GA		OF DRAWDOWN NOTAL VOLUME PU		MOUTH PRESSURE TO PUMP	N/A N/A	PPM	INTEGRI	TY: CAP X CASING X LOCKED X COLLAR X	= =
TOTAL \ PUR((purge i	GED	1.46 GA minute) x time du		<0.01 c 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHAF TIMER SETTING	RGE N/A S	EC.
PURGE D	ATA										
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS	
8:15	5.14	140	14.01	3.37	4.75	0.10	39.8	208	~ 20 ft.		
8:20	5.14	140	11.88	3.52	4.62	0.10	32.6	236			
8:25 8:30	5.14 5.14	140 140	11.77 12.13	3.50 3.40	4.65 4.66	0.10 0.10	27.8 21.6	235 231			
8:35	5.14	140	11.81	3.37	4.74	0.10	15.8	231			
8:40	5.14	140	11.51	3.34	4.78	0.10	14.9	230			
8:45	5.14	140	11.46	3.33	4.77	0.10	14.2	230			
	Collect	Sample									
TYPE C	NT DOCUMEN' DE PUMP ED BLADDER MCO BLADDER EOPUMP	_		- R TEFLON LINED ITY POLYETHYLEI	NE	POL STA	PUMP MATERIAL YVINYL CHLORIDE INLESS STEEL CON (Dedicated)			TYPE OF BLADDER MA	TERIAL
ANALYTIC To Be Collected		ERS				ESERVATION THOD	VOLUME REQUIRED	ļ.	SAMPLE COLLECTED		
SVC VPI Diss pH X Am X Chl X Sul X Spe	NUMBER VOCs: Trimethylpentenes 8260 B SVOCs: NDPA and BEHP 8270 C VPH MA VPH Dissolved Fe DIS. 6010B					L / 4 DEG. C DEG. C L / 4 DEG. C O3 / 4 DEG. C DEG. C DEG. C DEG. C DEG. C DEG. C	1 X 500 mL 1 X 500 mL 1 X 500 mL		X Chlo	Cs Fe nonia-Nitrogen ride ate Conductivity	
PURGE WA	URGE OBSERVATIONS URGE WATER NUMBER OF GALLONS ONTAINERIZED YES NO GENERATED ~ 1.5 gal.						SKETCH				
NOTES		Ifate analysis colle			<u> </u>						
SIGNATURE							by: LJ by: SAM by: CTM			Woo	od.

		* & INFRASTRU CORD - LO		ITIONS, INC. ROUNDWA	TER SAI	MPLING					
PROJECT	OLIN CHEMICA	AL SUPERFUND S	SITE, WILMINGTOI	N, MA	WELL	L ID	GW-CA1			ROUND	NO. 4
SAMPLE ID		OC-GW-CA1	1		SITE TY	YPE	Superfund]	DATE	11/15/2018
TIME	START	8:00 END	9:05		JOB NUMBE	ER	6107190016			BOTTLE TIME	8:55
QC SAM	EVEL / PUMP S	SETTINGS N/A	X TOP	EMENT POINT OF WELL RISER OF PROTECTIVE (CASING	PROTECTIVE CASING STIC (FROM GROU	KUP	FT.	PROTEC CASING DIFFERE	/ WELL	FT.
INITIAL DEF		6.03 FT	\neg	:PTH		PID	,		WELL		
FINAL DEF		6.03 FT			<u>.</u>	AMBIENT AIR PID WELL		PPM	DIAMETE WELL	YES	IN. NO N/A
DRAWDO VOLU (final - ir	ME <	<0.01 GAI		5 OF DRAWDOWN VO	OLUME	MOUTH PRESSURE TO PUMP	N/A	PPM] INTEGRI	TY: CAP	<u>x</u>
TOTAL V PURG (purge r	GED	2.29 GA r minute) x time du		<0.01 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHAI TIMER SETTING	N/A	SEC.
PURGE DA	ATA										
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. $(\mu S/cm)$ (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMM	1ENTS
8:05	6.03	160	18.64	0.860	6.84	0.10	52.1	92	~ 8 ft.		
8:10	6.03	160	14.89	0.900	6.90	0.10	38.9	38			
8:15	6.03	160	13.97	0.900	6.92	0.10	16.1	48			
	6:20 6.03 160 6:25 6.03 160 6:20 160		13.41	0.900	6.95 6.97	0.10 0.10	6.86 4.49	55 62			
8:30	6.03	160	12.30	0.920	6.98	0.10	2.12	81			
8:35	6.03	160	12.05	0.930	7.01	0.10	1.24	89			
8:40	6.03	160	11.63	0.940	7.05	0.10	1.13	96			
8:45	6.03	160	11.17	0.940	7.07	0.10	1.14	101			
8:50	6.03	160	11.09	0.940	7.09	0.10	1.12	102			
8:55	6.03	160	11.04	0.950	7.11	0.10	1.07	102			
	Collect	Sample			-						
TYPE O	NT DOCUMEN' OF PUMP OF BLADDER OF BLADDER OF BLADDER OF BLADDER OF BLADDER	: [TYPE OF TUBING TEFLON OR HIGH DENSI X LDPE (Dedica	TEFLON LINED TY POLYETHYLEN	E	POL'	PUMP MATERIAL YVINYL CHLORIDE INLESS STEEL CON (Dedicated)			TYPE OF BLADD)ER MATERIAL
ANALYTIC To Be Collected	CAL PARAMET	ERS				ESERVATION THOD	VOLUME REQUIRED		SAMPLE COLLECTED		
SVC VPH Diss pH X Amr X Chlo X Sulf	NUMBER VOCs: Trimethylpentenes 8260 B SVOCs: NDPA and BEHP 8270 C VPH MA VPH Dissolved Fe DIS. 6010B				METHOD REQUIRED HCL / 4 DEG. C 3 X 40 mL 4 DEG. C 2 X 1 L AG HCL / 4 DEG. C 3 X 40 mL HNO3 / 4 DEG. C 1 X 500 mL HNO3 / 4 DEG. C 1 X 500 mL HNO3 / 4 DEG. C 1 X 500 mL HNO3 / 4 DEG. C 1 X 500 mL				X Chlo	OCs I Fe nonia-Nitrogen oride ate cific Conductivity	
PURGE OF			NUMBER OF GAL	LONS		LOCATION	SKETCH				
NOTES	NTAINERIZED YES NO GENERATED ~ 2.3 gal.					Sampled I Prepared Checked I	by: SAM			W	ood.

			UCTURE SOLUT W FLOW GF	•	TER SAI	MPLING					
PROJECT	OLIN CHEMICA	AL SUPERFUND S	SITE, WILMINGTON	MA	WEL	L ID	MP-2#15			ROUND NO.	4
SAMPLE ID		OC-MP2#15	5		SITE T	YPE	Superfund			DATE 11/28/20	18
TIME	START	9:20 END	9:55		JOB NUMBE	ER	6107190016			BOTTLE TIME 9:45	
QC SAI	EVEL / PUMP S MPLE CTED ID	SETTINGS N/A	TOP (MENT POINT OF WELL RISER OF PROTECTIVE (R	CASING	PROTECTIVE CASING STIC (FROM GROU	KUP	FT.	PROTE CASING DIFFER	i / WELL	
INITIAL DE TO WA		N/A F		TH ~ 10.5	FT	PID AMBIENT AIR	N/A	DDM	WELL	multi port IN	_
FINAL DE TO WA		N/A F			FT.	PID WELL		PPM	DIAMET WELL	YES NO	N/A
DRAWDO VOLU (final - i	JME	N/A GA ch} or x 0.65 {4-inc		multi-port F DRAWDOWN VOTAL VOLUME PUR		MOUTH PRESSURE TO PUMP	N/A	PPM] INTEGF	CAP	<u></u>
TOTAL \ PUR(purge	GED	0.98 GA minute) x time du	AL. uration (minutes) x 0	N/A .00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHA TIMER SETTIN	N/A SEC	<u>. </u>
PURGE D	ATA										
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS	
9:25	-	150	12.16	1.00	6.64	10.82	751	93	~ 10.5 ft.	Multi-port well	
9:30 9:35	-	150 150	10.17 10.46	0.901 0.750	6.10 5.89	10.10 3.01	512 78	64 66			
9:40	-	150	10.46	0.747	5.87	3.09	73	66			
9:45	- Callagt	150	10.61	0.746	5.87	3.11	70	65			
	Collect	Sample									
TYPE C	NT DOCUMEN DE PUMP ED BLADDER MCO BLADDER EOPUMP		TYPE OF TUBING TEFLON OR T X HIGH DENSIT LDPE (Dedicat	Y POLYETHYLENI	E	POL STA	PUMP MATERIAL YVINYL CHLORIDE INLESS STEEL CON (Dedicated)	:		TYPE OF BLADDER MATE TEFLON OTHER	<u>RIAL</u>
ANALYTIC To Be Collecte	CAL PARAMET	ERS				ESERVATION THOD	VOLUME REQUIRED	!	SAMPLE COLLECTED	!	
SV/ VP Dis pH X Am X Chi X Sul X Sp	VOCs: Trimethylpentenes				4 DI HCI HNC 4 DI H2S 4 DI 4 DI 4 DI	METHOD REQUIRED HCL / 4 DEG. C 4 DEG. C HCL / 4 DEG. C 3 X 40 mL 2 X 1 L AG HCL / 4 DEG. C 1 X 500 mL 4 DEG. C 4 DEG. C 1 X 500 mL 1 X 500 mL 1 X 500 mL 1 X 500 mL			X Chl	OCs I Fe monia-Nitrogen oride ate cific Conductivity	
PURGE O			NUMBER OF GALL	ONS		LOCATION	SKETCH				
	ONTAINERIZED YES NO GENERATED ~ 1.0 gal. OTES Chloride and Sulfate analysis collected in one 500mL bottle MP-2 #15 replaces GW-42S						Sampled by: BEG Prepared by: SAM			woo	d.
SIGNATURI	E: Fiel	d Form w/ Signa	ature on File			Checked	by: CTM				

				W FLOW	•	c. WATER SA	AMPLING	3					
PROJECT	OLIN C	HEMICAL	SUPERFUND	SITE, WILMINGT	ON, MA	W	ELL ID	PZ-	-16RRR]	ROUND	NO. 4
SAMPLE ID)		OC-PZ-16RF	RR		SITE	TYPE	Su	perfund		j	DATE 1	1/14/2018
TIME	START		11:15 ENI	D 11:50	$\overline{}$	JOB NUM	BER	610	7190016			BOTTLE TIME	11:30
WATER L		PUMP SE	TTINGS		JREMENT POIN		<u> </u>						
	CTED ID		N/A	X TC	OP OF WELL RI OP OF PROTEC THER		PROTECTI CASING ST (FROM GR	ICKUP		FT.	PROTE CASING DIFFER	a / WELL	FT.
INITIAL DE TO WA		3.	.12 F	T. WELL (6 FT.	PID AMBIENT A	JR .	N/A	PPM	WELL DIAMET	ER 1.0	IN.
FINAL DE TO WA)ry F	T. SCREE		FT.	PID WELL MOUTH		N/A	PPM	WELL INTEGF	YES	NO N/A
DRAWDO VOLU (final - i	JME		I/A G.	AL. RATIO	O OF DRAWDO	WN VOLUME	PRESSURI		N/A	PSI]	CASING X LOCKED COLLAR	<u>X</u>
TOTAL \ PURG	GED			AL. uration (minutes)	N/A x 0 00026 gal/n	ml)	REFILL TIMER SETTING		N/A	SEC.	DISCHA TIMER SETTIN	N/A	SEC.
PURGE D					7 0.00020 gain		0211110				0211111		
TIME	DEPT WATE (0.3	R (ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. CON (mS/cm) (3%)		DISS. O2 (mg/L) (10%)(>0.5	(N	BIDITY TU) s) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMM	ENTS
11:20	(0.5			8.92	2.27	6.07	11.28		39	-34	~ 6 ft.	GOIVIIVII	
	Well			Recharge I									
11:30	(Collect S	ample		 	_							
						_							
QE	NT DOC OF PUMP ED BLADI MCO BLA EOPUMP	DER	ATION		R TEFLON LIN		P(DF PUMP N DLYVINYL (TAINLESS S LICON (Dec	CHLORIDE STEEL			TYPE OF BLADD TEFLON OTHER	ER MATERIAL
ANALYTIC	CAL PAI	RAMETE	RS										
To Be Collected	d				THOD IMBER		RESERVATIO METHOD		OLUME REQUIRED		SAMPLE COLLECTED	<u>)</u>	
		thylpente			60 B		ICL / 4 DEG. C		3 X 40 mL		VO		
SV0		PA and BE	HP		70 C \ VPH		DEG. C ICL / 4 DEG. C		2 X 1 L AG 3 X 40 mL		SVO	OCs H	
Dis	solved Fe	,			S. 6010B 14500 H+B		INO3 / 4 DEG. DEG. C		X 500 mL		Dis.	. Fe	
<u> </u>	monia-Nit	rogen			14500 H+B -107-06-1		DEG. C 12SO4 / 4 DEG		X 500 mL X 250 mL			monia-Nitrogen	
X Chl				300 300			DEG. C DEG. C		X 500 mL X 500 mL		X Chl		
X Spe	X Specific Conductivity SM 2510B					4	DEG. C	1	X 500 mL		X Spe	ecific Conductivity	
X Dis	X Dissolved AI, Cr DIS. 6010B						INO3 / 4 DEG.	C 1	X 500 mL		X Dis.	. Al, Cr	
PURGE O	BSERV	ATIONS					LOCATIO	N SKETC	н				
PURGE WA		YES	NO	NUMBER OF G		0.1 gal.							
NOTES	Chloride	and Sulfa	nte analysis coll	ected in one 500	mL bottle								
			nple recharge										
													-
							Sample	ed by: BEG				14/6	od.
								ed by: SAM				AAC	, ,,,,
SIGNATURE	E .	Field	Form w/ Sign:	ature on File			Checked by: CTM						

				W FLOW (•		AMPLING	ì					
PROJECT	OLIN C	HEMICAL	SUPERFUND	SITE, WILMINGTO	ON, MA	WE	ELL ID	PZ-17RRR]	ROUND NO.	4	
SAMPLE ID			OC-PZ17RF			SITE -	TYPE	Superfund]	DATE 11/14/20	18	
TIME	START		10:05 ENI	D 10:35	$\overline{}$	JOB NUME	BER	6107190016		1	BOTTLE TIME 10:25		
WATER L		PUMP S	ETTINGS		REMENT POINT								
	CTED ID		N/A	X TO	P OF WELL RIS P OF PROTECT HER		PROTECTIV CASING STI (FROM GRO	CKUP	FT.	PROTECTIVE CASING / WELL DIFFERENCE N/A FT.			
INITIAL DE TO WA	TER	2	2.35 F	TT. WELL D	DEPTH ~ 6.0	65 FT.	PID AMBIENT AI	R N/A	PPM	WELL DIAMET	TER 1.0 IN.		
FINAL DE TO WA		Į.	Dry F	T. SCREE		FT.	PID WELL MOUTH	N/A	PPM	WELL INTEGF	YES NO X	N/A	
DRAWDO VOLU (final - i	JME		N/A G		OF DRAWDOW		PRESSURE TO PUMP	N/A	N/A PSI		CASING X X LOCKED COLLAR X	<u> </u>	
TOTAL \ PUR((purge i	GED			AL. uration (minutes)	N/A ninutes) x 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHA TIMER SETTIN	N/A SEC	<u>).</u>	
PURGE D	ATA												
TIME	DEPT WATE (0.3	R (ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. CONI (mS/cm) (3%)	D. pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS		
10:10		-		7.48	0.741	6.86	4.82	669	-47	~ 6.5 ft.			
10:05	Well		•	Recharge									
10:25	,	Collect S	<u> Баптріе</u>										
									1				
					<u> </u>								
EQUIPMEI TYPE C	DE PUMP	UMENI	ATION	TYPE OF TUBIN	<u>IG</u>		TYPE O	F PUMP MATERIAL			TYPE OF BLADDER MATE	ERIAL	
	ED BLADI				R TEFLON LINE			LYVINYL CHLORIDE AINLESS STEEL	Ē		TEFLON		
. =	OPUMP	DDEK		X LDPE (Dedi	SITY POLYETHY icated)	LENE		ICON (Dedicated)			OTHER		
ANALYTIC	CAL PAI	RAMETE	ERS										
To Be Collected	d				THOD <u>MBER</u>		RESERVATION <u>ETHOD</u>	I VOLUME REQUIRED	<u>)</u>	SAMPLE COLLECTED	<u>0</u>		
vo	Cs: Trime	thylpente	enes	826	0 B	Н	CL / 4 DEG. C	3 X 40 mL		VO	Cs		
SVO	OCs: NDF H	PA and BI	EHP		0 C VPH		DEG. C CL / 4 DEG. C	2 X 1 L AG 3 X 40 mL		SVO	OCs H		
Dis	solved Fe			DIS	. 6010B	H	NO3 / 4 DEG. (1 X 500 mL		Dis			
pH X Am	monia-Nit	rogen			4500 H+B 107-06-1		DEG. C 2SO4 / 4 DEG.	1 X 500 mL C 1 X 250 mL		pH X Am	monia-Nitrogen		
X Chl				300 300			DEG. C DEG. C	1 X 500 mL 1 X 500 mL		X Chl			
	ecific Con	ductivity			2510B		DEG. C	1 X 500 mL			ecific Conductivity		
X Dis	solved Al,	Cr		DIS	i. 6010B	1H	NO3 / 4 DEG. (C 1 X 500 mL	-	X Dis	. Al, Cr		
PURGE O	JRGE OBSERVATIONS							N SKETCH					
PURGE WA		YES	NO	NUMBER OF GA GENERATED		.1 gal.							
NOTES	OTES Chloride and Sulfate analysis collected in one 500mL bottle												
	Well wei	nt dry; sa	mple recharge										
												-	
								d by: BEG			WOO	d	
								d by: SAM			*****	U.	
SIGNATURE	Ξ.	Field	Form w/ Sign:		Checked by: CTM								

		& INFRASTRU CORD - LOV		•	ATER SA	MPLING					
PROJECT	OLIN CHEMICA	AL SUPERFUND S	ITE, WILMINGTO	N, MA	WEL	L ID	PZ-18R			ROUND NO). 4
SAMPLE ID		OC-PZ-18R			SITE T	YPE	Superfund			DATE 11/	14/2018
TIME	START	10:15 END	11:00		JOB NUMBI	ER	6107190016]	BOTTLE TIME	10:50
QC SAN	EVEL / PUMP S	SETTINGS N/A	TOF	REMENT POINT P OF WELL RISER OF PROTECTIVE		PROTECTIVE CASING STIC (FROM GROU	KUP	FT.	PROTEC CASING DIFFERE	/ WELL	FT.
INITIAL DEI		2.29 FT				PID			WELL		
FINAL DEI		2.54 FT	(TOR) - SCREEN	~ 5.99	FT.	AMBIENT AIR	N/A	PPM	DIAMETE WELL	ER 1.25 YES	IN. NO N/A
DRAWDO VOLU	ME	0.01 GA		OF DRAWDOWN		MOUTH PRESSURE	N/A	PPM	INTEGRITY: CAP X CASING X LOCKED		
TOTAL V	/OL.	ch} or x 0.65 {4-inch	L.	OTAL VOLUME PU	JRGED	TO PUMP REFILL TIMER	N/A	PSI SEC.	DISCHAF TIMER	RGE N/A	SEC.
		r minute) x time du	ration (minutes) x	0.00026 gal/ml)		SETTING			SETTING	<u> </u>	
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMEN	TS
10:20	2.54	120	7.38	5.18	4.65	0.10	864	-21	~ 5.5 ft.		
10:25	2.54	120	7.59	4.63	4.82	0.10	352	-20			
10:30	2.54	120	7.70	4.51	5.46	0.10	166	-38			
10:35 10:40	2.54 2.54	120 120	7.74 7.58	4.51 4.53	5.47 5.70	0.10	85.9 59.7	-31 -37			
10:45	2.54	120	7.63	4.52	5.68	0.10	60.4	-34			
10:50	2.54	120	7.78	4.53	5.78	0.10	55.3	-37			
	Collect	Sample									
TYPE O	NT DOCUMEN OF PUMP OF BLADDER OF BLADDER OF BLADDER OF BLADDER	: [<u>[</u>		- TEFLON LINED ITY POLYETHYLE	NE	POL STA	PUMP MATERIAL YVINYL CHLORIDE INLESS STEEL CON (Dedicated)			TYPE OF BLADDER TEFLON OTHER	MATERIAL
ANALYTIC To Be Collected	CAL PARAMET	ERS	MET NUM	HOD IBER		ESERVATION THOD	VOLUME REQUIRED	ļ.	SAMPLE COLLECTED		
VOCs: Trimethylpentenes						HCL / 4 DEG. C 3 X 40 mL 4 DEG. C 2 X 1 L AG HCL / 4 DEG. C 3 X 40 mL HNO3 / 4 DEG. C 1 X 500 mL 4 DEG. C 1 X 500 mL H2SO4 / 4 DEG. C 1 X 250 mL 4 DEG. C 1 X 500 mL			VOCs SVOCs VPH Dis. Fe pH X Ammonia-Nitrogen X Chloride X Sulfate		
X Spe	X Sulfate 300.0 X Specific Conductivity SM 2510B X Dissolved Al, Cr DIS. 6010B						1 X 500 mL 1 X 500 mL 1 X 500 mL			cific Conductivity	
PURGE OI PURGE WA CONTAINEF	RIZED YES	_ !	NUMBER OF GAI GENERATED cted in one 500m	<u>~ 1.1 g</u>	jal	LOCATION	SKETCH				
SIGNATURE	IGNATURE: Field Form w/ Signature on File					Sampled Prepared Checked	by: SAM			wo	od.

		& INFRASTRU CORD - LOV		•	ATER SA	MPLING						
PROJECT	OLIN CHEMICA	AL SUPERFUND SI	ITE, WILMINGTO	N, MA	WEL	L ID	PZ-24			ROUND NO. 4		
SAMPLE ID		OC-PZ-24			SITE T	YPE	Superfund			DATE 11/14/2	2018	
TIME	START	8:50 END	9:20		JOB NUMB	ER	6107190016			BOTTLE TIME 9:1	5	
QC SAI	EVEL / PUMP S MPLE CTED ID	SETTINGS N/A	X TOP	EMENT POINT OF WELL RISE OF PROTECTI		PROTECTIVE CASING STIC (FROM GROU	KUP	FT.	PROTECTIVE CASING / WELL DIFFERENCE N/A FT.		=T.	
INITIAL DE TO WA		8.00 FT				PID			WELL			
FINAL DE TO WA		8.18 FT	(TOR) : SCREEN	~ 17.6	65 FT.	AMBIENT AIR PID WELL	N/A	PPM	DIAMETI WELL	ER 1.5 I	N/A	
DRAWDO VOLU	JME	0.01 GAI		5 OF DRAWDOWN		MOUTH PRESSURE	N/A	PPM	INTEGR	TY: CAP X CASING X LOCKED X	<u> </u>	
TOTAL V	VOL. GED	ch} or x 0.65 {4-inch 0.98 GAI r minute) x time dur	L.	0.01	PURGED	TO PUMP REFILL TIMER SETTING	N/A	PSI SEC.	DISCHAI TIMER SETTING	N/A s	EC.	
PURGE D		minute) x time dui	ation (minutes) x	0.00020 gai/iiii)		SETTING			SETTING	-		
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND (mS/cm) (3%)	. pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS		
8:55	8.18	150	12.36	1.73	5.73	7.83	58.1	-16	~ 16 ft.			
9:00	8.18	150	13.03	1.75	5.58	6.35	54.0	-27				
9:05 9:10	8.18 8.18	150 150	13.23 13.40	1.80	5.53 5.52	5.80 5.70	38.1 38.2	-31 -35				
9:15	8.18	150	13.41	1.82	5.52	5.67	37.4	-36				
	Collect	Sample										
TYPE C	NT DOCUMEN DE PUMP ED BLADDER MCO BLADDER EOPUMP] [<u></u>		- TEFLON LINED TY POLYETHYL		POL'	PUMP MATERIAL YVINYL CHLORIDE NLESS STEEL CON (Dedicated)	:		TYPE OF BLADDER MA	TERIAL	
ANALYTIC To Be Collecte	CAL PARAMET	ERS	METI <u>NUM</u>			ESERVATION THOD	VOLUME REQUIRED	1	SAMPLE COLLECTED			
□vo	Cs: Trimethylpen	tenes	8260	В	НС	L / 4 DEG. C	3 X 40 mL		VOC	Os .		
SV	OCs: NDPA and I	BEHP	8270 MA V			EG. C L / 4 DEG. C	2 X 1 L AG 3 X 40 mL		SVC			
Dis	solved Fe		DIS.	6010B	HN	O3 / 4 DEG. C	1 X 500 mL		Dis.			
DH X Am	monia-Nitrogen			500 H+B 07-06-1)EG. C SO4 / 4 DEG. C	1 X 500 mL 1 X 250 mL		pH X Amn	nonia-Nitrogen		
X Chi			300.0 300.0			EG. C EG. C	1 X 500 mL 1 X 500 mL		X Chlo			
	ecific Conductivity	,		510B		EG. C	1 X 500 mL			cific Conductivity		
X Dis	solved Al, Cr		DIS.	6010B	HN	O3 / 4 DEG. C	1 X 500 mL		X Dis.	Al, Cr		
	BSERVATION					LOCATION	SKETCH					
PURGE WA			NUMBER OF GAL GENERATED	LONS 1.0	gal.							
NOTES	Chloride and Su	Ifate analysis collec	cted in one 500m	L bottle								
						Sampled I	by: BEG				لہ	
						Prepared				WOO) (7.	
SIGNATURI	E: Fiel	d Form w/ Signat	ture on File			Checked by: CTM						

		& INFRASTRU CORD - LOV		•	ATER SA	MPLING					
PROJECT	OLIN CHEMICA	AL SUPERFUND S	ITE, WILMINGTO	N, MA	WEL	L ID	PZ-25			ROUND N	NO. 4
SAMPLE ID		OC-PZ-25			SITE T	YPE	Superfund			DATE 1	1/14/2018
TIME	START	7:55 END	8:45		JOB NUMBI	ER	6107190016]	BOTTLE TIME	8:30
QC SAN	EVEL / PUMP : MPLE CTED ID	SETTINGS N/A	X TOP	REMENT POINT P OF WELL RISEF P OF PROTECTIVI		PROTECTIVE CASING STIC (FROM GROU	KUP	FT.	PROTEC CASING DIFFERI	/ WELL	FT.
INITIAL DEI		7.55 FT				PID			WELL		
FINAL DEI		7.57 FT	(TOR) - SCREEN	~ 17.75	5 FT.	AMBIENT AIR	N/A	PPM	DIAMETI WELL	ER 1.5 YES	IN. NO N/A
DRAWDO VOLU	OWN	<0.01 GA	FT. VOLUME	MOUTH PRESSURE	N/A	PPM		TY: CAP X CASING X LOCKED X	= =		
(final - ir	nitial x 0.16 (2-inc	ch} or x 0.65 {4-inch		OTAL VOLUME PI		TO PUMP	N/A	PSI	<u> </u> -	COLLAR X	
TOTAL V PURO (purge r	GED	1.37 GA r minute) x time du		<0.01 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHAI TIMER SETTING	N/A	SEC.
PURGE DA	ATA										
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMME	ENTS
8:00	7.57	150	16.11	0.461	5.52	2.86	35.6	158	~ 15 ft.		
8:05	7.57	150	14.77	0.659	5.57	0.91	63.5	123			
8:10	7.57	150	14.61	0.710	5.57	0.98	63.0	104			
8:15 8:20	7.57 7.57	150 150	14.50 14.34	0.748 0.784	5.55 5.54	1.02	62.9 62.4	91 84			
8:25	7.57	150	14.35	0.787	5.54	0.99	62.1	80			
8:30	7.57	150	14.30	0.789	5.54	0.98	62.1	78			
	Collect	Sample									
TYPE O	NT DOCUMEN OF PUMP ED BLADDER MCO BLADDER EOPUMP	<u>:</u> [- TEFLON LINED ITY POLYETHYLE	:NE	POL STA	PUMP MATERIAL YVINYL CHLORIDE INLESS STEEL CON (Dedicated)			TYPE OF BLADDE TEFLON OTHER	ER MATERIAL
ANALYTIC To Be Collected	CAL PARAMET	ERS	MET			ESERVATION	VOLUME		SAMPLE		
			<u>NUM</u>	<u>IBER</u>	<u>ME</u>	THOD	REQUIRED		COLLECTED		
VOCs: Trimethylpentenes 8260 B SVOCs: NDPA and BEHP 8270 C VPH MA VPH Dissolved Fe DIS. 6010B pH SM 4500 H+B X Ammonia-Nitrogen 10-107-06-1 X Chloride 300.0 X Sulfate 300.0 X Specific Conductivity SM 2510B						HCL / 4 DEG. C 3 X 40 mL 4 DEG. C 2 X 1 L AG HCL / 4 DEG. C 3 X 40 mL HNO3 / 4 DEG. C 1 X 500 mL 4 DEG. C 1 X 500 mL H2SO4 / 4 DEG. C 1 X 250 mL 4 DEG. C 1 X 500 mL 4 DEG. C 1 X 500 mL 4 DEG. C 1 X 500 mL			X Chlo	OCs I Fe nonia-Nitrogen oride	
	solved Al, Cr			6010B		DEG. C O3 / 4 DEG. C	1 X 500 mL 1 X 500 mL		X Dis.		
PURGE O	BSERVATION	S				LOCATION	SKETCH				
PURGE WA			NUMBER OF GAI GENERATED	LLONS 1.4 g	gal.						
NOTES	Chloride and Su	Ilfate analysis colle	cted in one 500m	L bottle							
SIGNATURE	IGNATURE: Field Form w/ Signature on File						by: BEG by: SAM by: CTM			Wo	od.

		ER ENVIRONI CORD - LO			•	MPLING					
PROJECT	OLIN CHEMICA	AL SUPERFUND S	ITE, WILMINGTO	N, MA	WEI	LL ID	B-03]	ROUND NO.	4
SAMPLE ID		OC-B-03			SITE T	YPE	Superfund]	DATE 11/28/2	2018
TIME	START	8:15 END	9:35		JOB NUMB	ER	6107190016]	BOTTLE TIME 9:1	5
QC SAN	EVEL / PUMP S	SETTINGS N/A	X TOP	EMENT POINT OF WELL RISER OF PROTECTIV		PROTECTIVE CASING STIC (FROM GRO	CKUP	vey FT.	PROTEC CASING DIFFERE	/ WELL	= T.
INITIAL DE		9.56 FT	T. WELL DE			PID			WELL		
FINAL DE		9.58 FT	(TOR)	~ 15.43	2 FT.	AMBIENT AIF	R N/A	PPM	DIAMETE WELL	ER <u>2</u> I	N/A
DRAWDO	OWN		LENGTH	-	FT.	MOUTH	N/A	PPM		ITY: CAP X CASING X	
VOLU (final - i		<0.01 GA ch} or x 0.65 {4-inch		OF DRAWDOWN OTAL VOLUME P		PRESSURE TO PUMP	N/A	PSI]	LOCKED X COLLAR X	- =
TOTAL V PURO (purge r	GED	2.57 GA		<0.01 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHAI TIMER SETTING	N/A s	EC.
PURGE D											
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS	
8:30	9.58	180	14.40	0.153	6.43	11.17	15.8	203	~ 14 ft.		
8:35	9.58	180	13.54	0.132	6.30	8.31	6.24	236			
8:40	9.58	180	13.01	0.129	5.95	8.72	4.62	270			
8:45 8:50	9.58 9.58	180 180	12.78 12.55	0.127 0.123	5.78 5.53	10.33 9.58	2.75 2.81	285 298			
8:55	9.58	180	12.40	0.127	5.53	9.33	2.43	303			
9:00	9.58	180	12.35	0.125	5.50	9.97	1.94	308			
9:05	9.58	180	12.28	0.126	5.47	9.79	1.98	310			
9:10	9.58	180	12.22	0.126	5.45	9.62	2.01	313			
9:15	Collect	Sample									
TYPE C	NT DOCUMEN' OF PUMP ED BLADDER MCO BLADDER EOPUMP	: [<u>[</u>		TEFLON LINED TY POLYETHYLE	ENE	POL	F PUMP MATERIAL YVINYL CHLORIDE INLESS STEEL CON (Dedicated)	:		TYPE OF BLADDER MA	TERIAL
ANALYTIC To Be Collected	CAL PARAMET	ERS	MET <u>NUM</u>			RESERVATION	VOLUME REQUIRED	<u>)</u>	SAMPLE COLLECTED		
X SVC X VPI X Diss	Cs: Trimethylpeni DCs: NDPA and E H solved Fe			C /PH 6010B	4 D HC	HCL / 4 DEG. C 3 X 40 mL 4 DEG. C 2 X 1 L AG HCL / 4 DEG. C 3 X 40 mL HNO3 / 4 DEG. C 1 X 500 mL			X VOC X SVO X VPH X Dis. X pH	OCs I	
X Amı Chl Sul	X pH						C 1 X 250 mL 1 X 500 mL 1 X 500 mL 1 X 500 mL 1 X 500 mL		X Amn Chlo Sulfa		
PURGE OF PURGE WAS CONTAINED		_ 1	NUMBER OF GAI GENERATED	LONS <u>~ 2.6 </u>	gal.	LOCATION	SKETCH				
SIGNATURE	olGNATURE: Field Form w/ Signature on File						by: LJ by: SAM by: CTM			woo	od.

				astructure, ROUNDWAT		IPLING						
PROJECT	OLIN CHEMIC	AL SUPERFUND S	SITE, WILMINGTO	ON, MA	WEL	L ID	GW-13]	ROUND NO). 4	
SAMPLE ID		OC-GW-13	3		SITE TY	YPE	Superfund]	DATE 11/	28/2018	
TIME	START	9:40 ENI	11:05		JOB NUMBE	ER	6107190016		BOTTLE TIME 10:40			
WATER LE	VEL / PUMP S	ETTINGS	MEASUR	REMENT POINT	IT POINT							
QC SAN COLLEC	MPLE CTED ID	N/A		P OF WELL RISER P OF PROTECTIVE	CASING	PROTECTIVE CASING STICK	(UP		PROTECTIVE CASING / WELL			
INIITIAL DE	DTU		ОТІ	HER		(FROM GROU	ND) See surv	ey FT.	DIFFERENC	E	FT.	
TO WA		10.47 F	T. WELL D	EPTH ~ 19.75	FT.	PID AMBIENT AIR	N/A	PPM	WELL DIAMETER	3	IN.	
FINAL DEI		10.77 F	T. SCREEN		FT.	PID WELL MOUTH	N/A	PPM	WELL INTEGRITY:	YES CAP X	NO N/A	
DRAWDO VOLU	ME	0.11 G/	AL. RATIO	OF DRAWDOWN V		PRESSURE TO PUMP	N/A	PSI	(CAP X CASING X OCKED X COLLAR X	= =	
TOTAL V		onj or x 0.00 (4 mo		OTAL VOLONIL TO		REFILL	14/71	101	DISCHARGE			
PURG	GED	2.72 G/		0.04 x 0.00026 gal/ml)		TIMER SETTING	N/A	SEC.	TIMER SETTING	N/A	SEC.	
PURGE DA	ATA											
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (%) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMEN	ITS	
9:40	10.77	200	11.78	0.071	6.88	> 50	7.88	225	~ 18 ft.		-	
9:45	10.77	200	11.77	0.070	6.56	> 50	7.80	241				
9:50	10.77	200	11.72	0.070	6.30	> 50	7.46	255				
9:55	10.77	190	11.58	0.071	6.05	48.19	8.15	267				
10:00	10.77	190	11.48	0.071	5.80	48.38	7.76	272				
10:05	10.77	190	11.54	0.072	5.44	48.70	6.69	280				
10:10	10.77 10.77	190 190	11.46 11.49	0.072 0.073	5.18	30.24 28.71	5.03	282 289				
10:15	10.77	190	11.57	0.073	5.08 4.95	24.93	4.54 4.41	292				
10:25	10.77	190	11.55	0.074	4.89	24.72	3.86	288				
10:30	10.77	190	11.41	0.075	4.87	23.71	3.93	284				
10:35	10.77	190	11.25	0.076	4.81	23.70	3.88	293				
10:40	Collec	t Sample										
	NT DOCUMEN	TATION	T/DE 05 T/DIV	•		7/05 05 /				T/DE 05 DI ADDES		
	<u>F PUMP</u> D BLADDER		TYPE OF TUBIN	<u>G</u> R TEFLON LINED			VINYL CHLORIDE		Г	TYPE OF BLADDEF	R MATERIAL	
	MCO BLADDER			SITY POLYETHYLEN	IE	STAINLESS STEEL			[OTHER		
X GE	OPUMP		X LDPE (Dedi	cated)		X SILICO	ON (Dedicated)					
ANALYTIC To Be Collected	AL PARAMET	ERS		THOD MBER		ESERVATION THOD	VOLUME REQUIRED		SAMPLE COLLECTED			
TX IVO	Cs: Trimethylper	itanac	8260	n B	нсі	_/ 4 DEG. C	3 X 40 mL		X VOCs			
X SVC	OCs: NDPA and		8270	ОС	4 DI	EG. C	2 X 1 L AG		X SVOCs			
X VPH X Diss	H solved Fe		MA '	VPH . 6010B		_ / 4 DEG. C D3 / 4 DEG. C	3 X 40 mL 1 X 500 mL		X VPH X Dis. Fe			
ХрН				4500 H+B		EG. C	1 X 500 mL		ХрН			
_	monia-Nitrogen oride		10-1 300.	07-06-1 0		604 / 4 DEG. C EG. C	1 X 250 mL 1 X 500 mL		X Ammonia Chloride	ū		
Sulf			300.			EG. C	1 X 500 mL		Sulfate			
	ecific Conductivit solved Al, Cr	у		2510B . 6010B		EG. C O3 / 4 DEG. C	1 X 500 mL 1 X 500 mL		Specific Dis. Al, C	Conductivity		
	301700 711, 01		510.	00100		307 4 DEG. 0	1 X 000 IIIL		Dio. 74, C	<i>3</i> 1		
PURGE OF	SERVATIONS	i				LOCATION S	КЕТСН					
PURGE WA' CONTAINER		NO	NUMBER OF GA GENERATED	LLONS 2.7 ga	J							
NOTES												
						Sampled by: LJ				WO	04	
						Prepared b				44 U	UU.	
SIGNATURE	E: Fie	eld Form w/ Signa	ature on File			Checked b	y: CIM					

		& INFRASTRU CORD - LOV		•	ATER SAI	MPLING				
PROJECT	OLIN CHEMICA	AL SUPERFUND SI	ITE, WILMINGTO	N, MA	WEL	.L ID	GW-16R			ROUND NO. 4
SAMPLE ID		OC-GW-16R	R		SITE T	YPE	Superfund			DATE 11/28/2018
TIME	START	10:05 END	12:30		JOB NUMBE	ER	6107190016			BOTTLE TIME 10:40
QC SAM		SETTINGS UP/ MS/ MSD	X TOP	EMENT POINT OF WELL RISER OF PROTECTIVE			PROTECTIVE CASING STICKUP FROM GROUND) FT.		PROTECTIVE CASING / WELL DIFFERENCE N/A FT.	
INITIAL DEF		8.41 FT		PTH ~ 17.2		PID AMBIENT AIR	N/A	DDM	WELL DIAMET	ER 2 IN.
FINAL DEF		8.95 FT	(TOR) SCREEN LENGTH			PID WELL MOUTH	N/A	PPM	WELL	YES NO N
DRAWDO VOLU (final - ir	ME	0.08 GAI ch} or x 0.65 {4-inch	L. RATIO	•	PRESSURE TO PUMP	N/A	PSI		TY: CAP	
TOTAL V PURG (purge r	GED	1.37 GAI		0.06 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHA TIMER SETTING	N/A SEC.
PURGE DA	ATA									
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
10:10	8.94	150	11.33	0.220	8.28	9.47	326	-26	~ 16 ft.	
10:15	8.94	150	11.98	0.199	7.84	6.47	110	-16		
10:20	8.94	150	12.06	0.194	7.41	5.94	51.3	-4		
10:25 10:30	8.94 8.95	150 150	12.22 12.38	0.180 0.175	7.17	5.63 5.27	50.0 21.3	5		
10:35	8.95	150	12.40	0.175	7.09	5.22	22.7	5		
10:40	8.95	150	12.39	0.175	7.09	5.21	27.4	5		
	Collect	Sample								
TYPE O	NT DOCUMEN F PUMP D BLADDER MCO BLADDER OPUMP] [TEFLON LINED TY POLYETHYLEI	NE	POL STAI	PUMP MATERIAL YVINYL CHLORIDE NLESS STEEL CON (Dedicated)			TYPE OF BLADDER MATERIA TEFLON OTHER
ANALYTIC To Be Collected	CAL PARAMET	ERS	METI NUM			ESERVATION THOD	VOLUME REQUIRED	ı	SAMPLE COLLECTED	
	Cs: Trimethylpen DCs: NDPA and I		8260 8270 MA V	B C	HCL 4 DI	L/4 DEG. C EG. C L/4 DEG. C	3 X 40 mL 2 X 1 L AG 3 X 40 mL		X VO(X SV(X VPH	CS OCS
X Dissolved Fe						HNO3 / 4 DEG. C 1 X 500 mL HNO3 / 4 DEG. C 1 X 500 mL HNO3 / 4 DEG. C 1 X 500 mL			Chlo	nonia-Nitrogen oride
	BSERVATION:					LOCATION	SKETCH			
PURGE WA' CONTAINEF		NO (NUMBER OF GAL GENERATED	~ 1.4 g	al.					
SIGNATURE	IGNATURE: Field Form w/ Signature on File						by: BEG by: SAM by: CTM			WOOO

		ER ENVIRONI CORD - LO			•	MPLING					
PROJECT	OLIN CHEMICA	AL SUPERFUND S	SITE, WILMINGTO	N, MA	WEI	LL ID	GW-101			ROUND NO.	4
SAMPLE ID		OC-GW-101	1		SITE T	YPE	Superfund			DATE 11/27	7/2018
TIME	START	9:25 END	11:30		JOB NUMB	ER	6107190016]	BOTTLE TIME 10	0:05
QC SAN	EVEL / PUMP S MPLE CTED ID	SETTINGS N/A	X TOF	REMENT POINT OF WELL RISEF OF PROTECTIV HER		PROTECTIVE CASING STIC (FROM GROU	KUP	vey FT.	PROTE CASING DIFFER	/ WELL	FT.
INITIAL DE		10.50 FT				PID	NI/A	2011	WELL		
FINAL DE		10.50 FT				AMBIENT AIR		PPM	DIAMET WELL	YES N	IN. NO N/A
DRAWDC VOLU (final - in	IME <	<0.01 GA h} or x 0.65 {4-inch		11.5 OF DRAWDOWN OTAL VOLUME P		MOUTH PRESSURE TO PUMP	N/A	PPM] INTEGR	TY: CAP	
TOTAL V PURO (purge r	GED	1.82 GA minute) x time du		<0.01 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHA TIMER SETTING	N/A	SEC.
PURGE D	ATA										
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS	3
9:35	10.50	175	17.54	0.304	3.71	12.54	496	180	~ 17 ft.		
9:40	10.50	175	15.79	0.837	6.02	6.49	426	-69			
9:45 9:50	10.50 10.50	175 175	11.93 12.16	0.591 0.562	5.78 5.91	0.01	10.7 4.32	-1 -31			
9:55	10.50	175	12.10	0.535	5.87	0.01	3.97	-42			
10:00	10.50	175	12.01	0.509	5.78	0.02	2.61	-48			
10:05	10.50	175	12.02	0.513	5.77	0.02	2.43	-45			
	Collect	Sample									
TYPE C	NT DOCUMEN' DE PUMP ED BLADDER MCO BLADDER EOPUMP			- TEFLON LINED ITY POLYETHYLE	ENE	POL STA	PUMP MATERIAL YVINYL CHLORIDE INLESS STEEL CON (Dedicated)	:		TYPE OF BLADDER M TEFLON OTHER	1ATERIAL
ANALYTIC To Be Collected	CAL PARAMET	ERS	MET <u>NUM</u>			RESERVATION ETHOD	VOLUME REQUIRED	1	SAMPLE COLLECTED		
X SVO	Cs: Trimethylpent DCs: NDPA and E H solved Fe		8260 8270 MA \	B C	HC 4 E HC	METHOD REQUIRED HCL / 4 DEG. C 3 X 40 mL 4 DEG. C 2 X 1 L AG HCL / 4 DEG. C 3 X 40 mL HNO3 / 4 DEG. C 1 X 500 mL			X VO0 X SV0 X VPH X Dis.	Cs OCs	
X Dissolved Pe						DEG. C SO4 / 4 DEG. (DEG. C DEG. C DEG. C DEG. C	1 X 500 mL 1 X 500 mL 1 X 500 mL		Chlo	monia-Nitrogen oride tate cific Conductivity AI, Cr	
PURGE OF PURGE WAS CONTAINED			NUMBER OF GA GENERATED	LLONS _ ~ 1.8 <u></u>	gal.	LOCATION	SKETCH				
SIGNATURE						Sampled Prepared Checked	by: SAM			Woo	od.

		LER ENVIRONN CORD - LOV			•	MPLING					
PROJECT	OLIN CHEMICA	AL SUPERFUND SI	ITE, WILMINGTO	N, MA	WEL	L ID	IW-6			ROUND NO.	4
SAMPLE ID		OC-IW-6			SITE T	YPE	Superfund			DATE 11/27/201	18
TIME	START	9:30 END	11:35		JOB NUMB	ER	6107190016]	BOTTLE TIME 10:00	
QC SAM	EVEL / PUMP S MPLE CTED ID	SETTINGS N/A	X TOP	EMENT POINT OF WELL RISEF OF PROTECTIV		PROTECTIVE CASING STIC (FROM GROU	KUP	vey FT.	PROTE(CASING DIFFER	i / WELL	
INITIAL DE TO WA		9.87 FT				PID			WELL		7
FINAL DE TO WA		9.93 FT		~ 18.9		AMBIENT AIR		PPM	DIAMET WELL	YES NO	N/A
DRAWDO VOLU (final - i	IME	0.09 GAI ch} or x 0.65 {4-inch		 OF DRAWDOWN DTAL VOLUME P		MOUTH PRESSURE TO PUMP	N/A	PPM] INTEGR	CASING X	=
TOTAL \ PUR((purge i	GED	1.17 GAI r minute) x time dur		0.07 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHA TIMER SETTING	N/A SEC.]
PURGE D	ATA										
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS	
9:35	9.93	150	16.52	1.80	5.85	6.68	553	-56	~ 17 ft.		
9:40	9.93	150	15.79	1.83	6.02	6.49	426	-69			
9:45	9.93	150 150	15.20 14.83	1.85	6.22	6.14	254	-74 -79			
9:50 9:55	9.93 9.93	150	14.83	1.86 1.88	6.42	5.96 5.92	223 213	-78 -80			
10:00	9.93	150	14.31	1.88	6.45	5.91	215	-81			
	Collect	Sample									
TYPE C	NT DOCUMEN OF PUMP OF BLADDER MCO BLADDER OF OPUMP] [<u></u>		- TEFLON LINED TY POLYETHYLE	ENE	POL STA	PUMP MATERIAL YVINYL CHLORIDE INLESS STEEL CON (Dedicated)	Ξ		TYPE OF BLADDER MATER TEFLON OTHER	RIAL
ANALYTIC To Be Collected	CAL PARAMET	ERS	METI	HOD	PR	ESERVATION	VOLUME		SAMPLE		
			NUM	<u>BER</u>	ME	THOD	REQUIRED	<u>)</u>	COLLECTED	2	
X VOCs: Trimethylpentenes 8260 B X SVOCs: NDPA and BEHP 8270 C X VPH MA VPH X Dissolved Fe DIS. 6010B X JPH SM 4500 H+B X Ammonia-Nitrogen 10-107-06-1 Chloride 300.0 Sulfate 300.0 Specific Conductivity SM 2510B Dissolved Al, Cr DIS. 6010B						L / 4 DEG. C DEG. C L / 4 DEG. C O3 / 4 DEG. C DEG. C SO4 / 4 DEG. C	1 X 500 mL 1 X 500 mL 1 X 500 mL	- - - -	Chlo	OCs 1 Fe monia-Nitrogen oride	
PURGE OF PURGE WAS CONTAINED			NUMBER OF GAL GENERATED	LONS ~ 1.2	gal.	LOCATION	SKETCH				
NOTES											
SIGNATURE	olGNATURE: Field Form w/ Signature on File					Sampled Prepared Checked	by: SAM			WOO	d.

		ER ENVIRONN CORD - LOV		•		MPLING					
PROJECT	OLIN CHEMICA	AL SUPERFUND SI	ITE, WILMINGTO	N, MA	WEL	L ID	IW-10			ROUND NO.	4
SAMPLE ID		OC-IW-10			SITE T	YPE	Superfund			DATE 11/2	7/2018
TIME	START	11:50 END	13:30		JOB NUMBI	ER	6107190016			BOTTLE TIME 12	2:15
QC SAI	EVEL / PUMP S MPLE CTED ID	N/A	X TOP	EMENT POINT OF WELL RISER OF PROTECTIVE ER	CASING	PROTECTIVE CASING STIC (FROM GROU		vey FT.	PROTEG CASING DIFFER	/ WELL	FT.
INITIAL DE TO WA		10.55 FT			FT	PID	N/A	DDM	WELL DIAMET	ER 6	INI
FINAL DE		10.57 FT	(TOR) SCREEN	~ 21.17	FT.	AMBIENT AIR PID WELL	IN/A	PPM] DIAMET	-	IN. NO N/A
DRAWDO VOLU (final - i	JME	0.03 GAI		DF DRAWDOWN VOTAL VOLUME PU		MOUTH PRESSURE TO PUMP	N/A	PPM	INTEGR	TY: CAP	
TOTAL \ PUR(GED	0.98 GAI r minute) x time dur		0.03 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHA TIMER SETTING	RGE N/A	SEC.
PURGE D	ATA										
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENT	S
11:55	10.57	150	9.17	0.732	8.15	1.79	415	16	~ 20 ft.		
12:00 12:05	10.57 10.57	150 150	10.40 10.64	0.706 0.703	8.17 8.09	0.49	163 57.3	1			
12:10	10.57	150	10.68	0.702	8.05	0.27	59.1	1			
12:15	10.57 Collect	150 Sample	10.74	0.702	8.04	0.25	55.6	2			
TYPE C	NT DOCUMEN' DE PUMP ED BLADDER MCO BLADDER EOPUMP] [TEFLON LINED TY POLYETHYLEN	NE	POL'	PUMP MATERIAL YVINYL CHLORIDE NLESS STEEL CON (Dedicated)	≣		TYPE OF BLADDER I	<u>//ATERIAL</u>
ANALYTIC To Be Collecte	CAL PARAMET	ERS	METI <u>NUM</u>			ESERVATION THOD	VOLUME REQUIRED	<u>)</u>	SAMPLE COLLECTED		
X SV/PI X Dis X pH X Am Chi Sul	solved Fe	BEHP	SM 4 10-10 300.0 300.0 SM 2	C PH 6010B 500 H+B i7-06-1	4 D HC HN 4 D H28 4 D 4 D 4 D	L / 4 DEG. C IEG. C L / 4 DEG. C O3 / 4 DEG. C IEG. C SO4 / 4 DEG. C IEG. C IEG. C IEG. C IEG. C	3 X 40 mL 2 X 1 L AG 3 X 40 mL 1 X 500 mL 1 X 500 mL 1 X 250 mL 1 X 500 mL 1 X 500 mL 1 X 500 mL	- - - -	Chlo	OCs I Fe nonia-Nitrogen oride	
PURGE O PURGE WA CONTAINED			NUMBER OF GAL GENERATED	LONS ~ 1.0 gs	al	LOCATION	SKETCH				
SIGNATURI	E: Fial	d Form w/ Signat	ture on File			Sampled I Prepared Checked I	by: SAM			Woo	od.

WOOD ENVIRONMENT &						PAGE 1 OF 1	
FIELD DATA RECO	RD - SURFACE WA	TER					
PROJECT OLIN CHEMICAL S	SUPERFUND SITE, WILMING	ON, MA JOB N	IUMBER (6107190016	Di	ATE 12/4/2018	
FIELD SAMPLE ID	OC-SW-ISCO2	ACTIVITY TIME	START 8:40	END	9:00 BG	OTTLE TIME 8:50	
QC SAMPLES COLLECTED	N/A						
SURFACE WATER DATA		•	EQUIPMENT USED	TYPE	OF SURFACE WAT	rer	
WATER DEPTH	SPEC. COND		BEAKER	Х	STREAM/ DITCH	DECON FLUIDS USED:	
AT LOCATION 10		0.565 mS/cn	PACS BOMB		LAKE/ POND	DI WATER	
DEPTH OF SAMPLE FROM SURFACE	5 in. D.O.	.11 mg/L	X PERISTALTIC P	UMP	SEEP	POTABLE WATER	
TEMPERATURE 6.11	SALINITY DEG C	%	X FILTER (0.45 m	nicron)	MARSH	NONE	
TURBIDITY	ORP		X LDPE Tubing &	Silicon X	OTHER South Dit	tch	
0.1	0.1 NTU 160 mV						
pH 5.63	UNITS		Notes: Location price	or to discharge into	the East Ditch		
SEDIMENT DATA							
SEDIMENT SAMPLE START DEPTI	H TYPE OF SEDIMEN	г	EQUIPMENT FOR COLLECTI	ON DECON FLU	IIDS USED		
END DEPTH	ORG.	ANIC	HAND AUGER	DI WAT	ER		
TYPE OF SAMPLE GRAB	SANI		S.S. SPOON	一	LE WATER		
SAMPLE OBSERVATIONS	GRA'	ŒL.	ALUMINIUM PAN	LIQUIN			
ODOR	_ CLAY		DREDGE	OTHER		_	
COLOR	_		OTHER				
FLOC OBSERVED	CLEAR OF LEA	LITTER					
ANALYTICAL PARAMETERS SURFACE WATER	i METHO)	PRESERVATION	VOLUME	SAMPLE		
X Ammonia-Nitrogen	<u>NUMBE</u> 10-107-0			REQUIRED 1 X 250 mL	COLLECTED		
X Nitrate / Nitrite	300.0	N_		1 X 500 mL	X		
X <u>Chloride</u>	300.0	<u>N</u>		1 X 500 mL	X		
X Sulfate Specific Conductivity	300.0 SM 2510	<u>N</u> В N		1 X 500 mL 1 X 500 mL	_ X X		
X Total Al, Cr, Na	Total 60			1 X 500 mL	- 		
X Dissolved Al, Cr, Na	DIS. 601	0B Y	HNO3 / 4 DEG. C	1 X 500 mL	X		
					<u>-</u>		
ANALYTICAL PARAMETERS SEDIMENT) METH	OD	PRESERVATION	VOLUME	SAMPLE		
	NUME		METHOD I	REQUIRED	COLLECTED		
% Solids / Moisture	160.3 Total 60	LOD.		1 X 8 oz.	- H		
Total Al, Cr, Fe	10tai 60	<u> 10В</u>	4 DEG. 0	1 X 8 oz.	-		
					_		
		<u></u>			_ 🗆		
NOTES						المام جوري	
						wood.	
0.00	/O:						
SIGNATURE: Field Fo	orm w/ Signature on File					Sampled by: BEG	
						Prepared by: SAM Checked by: CTM	

WOOD ENVIRONMENT & INFRASTRU	ICTURE SOLUTIONS, I	NC.				PAGE 1 OF 1
FIELD DATA RECORD - SUF	RFACE WATER					
PROJECT OLIN CHEMICAL SUPERFUND	SITE, WILMINGTON, MA	JOB NUMBER	R 6	107190016	С	DATE 12/4/2018
FIELD SAMPLE ID OC-SW-ISCOS	3 (Not Sampled) AC	TIVITY TIME STAF	RT 8:20	END	8:35 B	OTTLE TIME N/A
OO OAMBUEO OOU FOTED	N/A					
QC SAIVIFLES COLLECTED	14/71		COLUDATENT LICED	TVDE	OF CUREAGE MA	TED
SURFACE WATER DATA	SDEC COND		QUIPMENT USED		OF SURFACE WA	
WATER DEPTH AT LOCATION N/A ft.	SPEC. COND N/	A mS/cm	BEAKER PACS BOMB	[X]	STREAM/ DITCH	DECON FLUIDS USED:
DEPTH OF SAMPLE FROM SURFACE N/A ft.	D.O. N/A mg/	/ L	PACS BOMB X PERISTALTIC PU	IMP \square	SEEP	POTABLE WATER
TEMPERATURE	SALINITY		X FILTER (0.45 mic	_	MARSH	NONE
N/A DEG C		%	X LDPE Tubing & S	· <u>=</u>	OTHER East Dite	<u> </u>
TURBIDITY N/A NTU	TURBIDITY ORP N/A NTU N/A mV					
pH N/A UNITS		N	lotes: East Ditch; Up	o-stream of South	Ditch confluence;	Along Railway
SEDIMENT DATA						
SEDIMENT SAMPLE START DEPTH	TYPE OF SEDIMENT	EQUIP	MENT FOR COLLECTIO	N DECON FLUI	DS USED	
END DEPTH	ORGANIC	Пн	AND AUGER	DI WATI	ER	
TYPE OF SAMPLE GRAB	SAND	S	.S. SPOON	POTABL	E WATER	
SAMPLE OBSERVATIONS	GRAVEL	Al	LUMINIUM PAN	LIQUINO	X	
ODOR	CLAY	D	REDGE	OTHER		
COLOR	OTHER	o	THER			
FLOC OBSERVED	CLEAR OF LEAF LITTER					
ANALYTICAL PARAMETERS	METHOD	2056		10111115	044515	
SURFACE WATER	METHOD <u>NUMBER</u>	PRES <u>FILTERED</u> <u>METH</u>		VOLUME <u>EQUIRED</u>	SAMPLE COLLECTED	
Ammonia-Nitrogen	10-107-06-1			X 250 mL	. 📙	
Nitrate / Nitrite Chloride	300.0 300.0	N 4 DE0		X 500 mL X 500 mL	- -	
Sulfate	300.0	N 4 DE		X 500 mL		
Specific Conductivity	SM 2510B	N 4 DEC		X 500 mL	- 📙	
Total Al, Cr, Na Dissolved Al, Cr, Na	<u>Total 6010B</u> DIS. 6010B			X 500 mL X 500 mL	- H	
Dissured Ai, Ci, Na	DI3. 0010B	<u> </u>	374 DEG. 0 1	X 300 IIIL		
ANALYTICAL PARAMETERS SEDIMENT	METHOD			VOLUME	SAMPLE	
% Solids / Moisture	<u>NUMBER</u> 160.3	4 DE		EQUIRED X 8 oz.	COLLECTED	
Total Al, Cr, Fe	Total 6010B	4 DE		X 8 oz.		
□					_ 🗆	
					_ 🗆	
<u> </u>					- 🖳	
		_			- H	
NOTES Not able to collect sample. Could not cross the	e South Ditch to access the East Di	tch. Mud ~ 16 in. deep.				
						wood.

SIGNATURE: Field Form w/ Signatur	re on File					Complete v DEC
						Sampled by: BEG Prepared by: SAM Checked by: CTM

WOOD ENVIRONMENT &	INFRASTRUCTURE SOLUT	TIONS, INC.				PAGE 1 OF 1	
FIELD DATA RECO	RD - SURFACE WAT	ER					
PROJECT OLIN CHEMICAL S	SUPERFUND SITE, WILMINGT	ON, MA JOB NU	IMBER 6	6107190016	D	DATE 12/4/2018	
FIELD SAMPLE ID	OC-SW-PZ16RRR	ACTIVITY TIME	START 9:10	END	9:25 B	OTTLE TIME 9:15	
QC SAMPLES COLLECTED	N/A						
SURFACE WATER DATA			EQUIPMENT USED	TYPE	OF SURFACE WA	TER	
WATER DEPTH	SPEC. COND		BEAKER	X	STREAM/ DITCH	DECON FLUIDS USED:	
AT LOCATION 7		0.594 mS/cm	PACS BOMB		LAKE/ POND	DI WATER	
DEPTH OF SAMPLE FROM SURFACE	3 in. D.O. 7.	80 mg/L	X PERISTALTIC P	UMP	SEEP	POTABLE WATER	
TEMPERATURE 5.70	SALINITY DEG C	%	X FILTER (0.45 m	iicron)	MARSH	NONE	
TURBIDITY	ORP		X LDPE Tubing &	Silicon X	OTHER South D	itch	
0.1	0.1 NTU 146 mV						
pH 5.76	UNITS		Notes: At location P	Z-16RRR			
SEDIMENT DATA							
SEDIMENT SAMPLE START DEPTI	H TYPE OF SEDIMEN		EQUIPMENT FOR COLLECTION	ON DECON FLU	IIDS USED		
END DEPTH	ORGA	NIC	HAND AUGER	DI WAT	ER		
TYPE OF SAMPLE GRAB	SAND		S.S. SPOON	POTAB	LE WATER		
SAMPLE OBSERVATIONS	GRAV	EL	ALUMINIUM PAN	LIQUIN	OX		
ODOR	The state of the s		DREDGE	OTHER			
COLOR	_		OTHER				
FLOC OBSERVED	CLEAR OF LEAF	LITTER	_				
ANALYTICAL PARAMETERS SURFACE WATER	i METHOI)	PRESERVATION	VOLUME	SAMPLE		
X Ammonia-Nitrogen	<u>NUMBEI</u> 10-107-0			REQUIRED 1 X 250 mL	COLLECTED		
X Nitrate / Nitrite	300.0	N N		1 X 500 mL	X		
X <u>Chloride</u>	300.0	N		1 X 500 mL	Х		
X Sulfate X Specific Conductivity	300.0 SM 2510	N		1 X 500 mL 1 X 500 mL	_ X X		
X Total Al, Cr, Na	Total 60°			1 X 500 mL	_ <u> </u>		
X Dissolved Al, Cr, Na	DIS. 601	OB Y	HNO3 / 4 DEG. C	1 X 500 mL	X		
		<u> </u>			-		
ANALYTICAL PARAMETERS SEDIMENT) METH	∩ n	PRESERVATION	VOLUME	SAMPLE		
	NUME		METHOD F	REQUIRED	COLLECTED		
% Solids / Moisture	160.3 Total 60°			1 X 8 oz.	- H		
Total Al, Cr, Fe	10tal 60	<u>ob</u>	4 DEG. 0	1 X 8 oz.	-		
					-		
		<u></u>			_ 🗆		
					_ 🔲		
NOTES						المام معادد	
						wood.	
0.00	(O)						
SIGNATURE: Field Fo	orm w/ Signature on File					Sampled by: BEG	
						Prepared by: SAM Checked by: CTM	

WOOD ENVIRONMENT &	NFRASTRUCTURE SOLUT	TIONS, INC.				PAGE 1 OF 1	
FIELD DATA RECO	RD - SURFACE WAT	ER					
PROJECT OLIN CHEMICAL S	UPERFUND SITE, WILMINGT	ON, MA JOB N	UMBER (6107190016		DATE 12/4/2018	
FIELD SAMPLE ID	OC-SW-PZ17RRR	ACTIVITY TIME	START 9:30	END	9:50 E	BOTTLE TIME 9:40	
QC SAMPLES COLLECTED	N/A						
SURFACE WATER DATA			EQUIPMENT USED	TYPE	OF SURFACE WA	TER	
WATER DEPTH	SPEC. COND	0.505	BEAKER	X	STREAM/ DITCH	DECON FLUIDS USED:	
AT LOCATION 12		0.595 mS/cm	PACS BOMB		LAKE/ POND	DI WATER	
DEPTH OF SAMPLE FROM SURFACE	5 in. D.O. 12	.33 mg/L	X PERISTALTIC P	PUMP	SEEP	POTABLE WATER	
TEMPERATURE 6.20	SALINITY DEG C	%	X FILTER (0.45 m	nicron)	MARSH	NONE	
TURBIDITY	ORP		X LDPE Tubing &	Silicon X	OTHER South D	litch	
24.9	24.9 NTU 110 mV						
pH 6.12	UNITS		Notes: At location P	Z-17RRR			
SEDIMENT DATA							
SEDIMENT SAMPLE START DEPTI	H TYPE OF SEDIMEN		EQUIPMENT FOR COLLECTI	ON DECONFLU	IIDS USED		
END DEPTH	ORGA	NIC	HAND AUGER	DI WAT	ER		
TYPE OF SAMPLE GRAB	SAND		S.S. SPOON		LE WATER		
SAMPLE OBSERVATIONS	GRAV	EL	ALUMINIUM PAN	LIQUIN			
ODOR	_ CLAY		DREDGE	OTHER			
COLOR	OTHE		OTHER				
FLOC OBSERVED	CLEAR OF LEAF	LITTER					
ANALYTICAL PARAMETERS SURFACE WATER	METHOI)	PRESERVATION	VOLUME	SAMPLE		
X Ammonia-Nitrogen	<u>NUMBEI</u> 10-107-0			REQUIRED 1 X 250 mL	COLLECTED		
X Nitrate / Nitrite	300.0	N N		1 X 500 mL	X		
X Chloride	300.0	N		1 X 500 mL	X		
X Sulfate X Specific Conductivity	300.0 SM 2510	N		1 X 500 mL 1 X 500 mL	_ X		
X Total Al, Cr, Na	Total 60°			1 X 500 mL	_ X		
X Dissolved Al, Cr, Na	DIS. 601	OB Y	HNO3 / 4 DEG. C	1 X 500 mL	X		
		<u> </u>			_		
ANALYTICAL PARAMETERS SEDIMENT	METH	OD.	PRESERVATION	VOLUME	SAMPLE		
	NUME		METHOD I	REQUIRED	COLLECTED		
% Solids / Moisture	160.3 Total 60 ⁻			1 X 8 oz.	- -		
Total Al, Cr, Fe	10tai 60	<u>ub</u>	4 DEG. C	1 X 8 oz.	-		
							
		<u></u>			_ 🗆		
NOTES							
						wood.	
SIGNATURE: Field Fo	orm w/ Signature on File					Sampled by: BEG	
						Prepared by: SAM Checked by: CTM	

WOOD ENVIRONMENT & II	NFRASTRUCTURE SOLU	TONS, INC.			PAGE 1 OF 1
FIELD DATA RECO	RD - SURFACE WAT	ER			
PROJECT OLIN CHEMICAL SI	UPERFUND SITE, WILMING	ON, MA JOB N	UMBER	6107190016	DATE 12/4/2018
FIELD SAMPLE ID	OC-SW-PZ18R	ACTIVITY TIME	START 10:15	END 11:05	BOTTLE TIME 10:25
QC SAMPLES COLLECTED	DUP/ MS/ MSD				
SURFACE WATER DATA			EQUIPMENT USED) TYPE OF SURF	
WATER DEPTH	SPEC. COND	0.5590/	BEAKER	X STREAM	M/ DITCH DECON FLUIDS USED:
AT LOCATION 15 DEPTH OF SAMPLE	in.] D.O.	0.558 mS/cn	PACS BOMB	LAKE/ F	POND DI WATER
FROM SURFACE	7 in. 5.	51 mg/L	X PERISTALTIC F	PUMP SEEP	POTABLE WATER
TEMPERATURE 5.98	SALINITY DEG C	%	X FILTER (0.45 n	<u> </u>	
TURBIDITY 56.3	ORP NTU	110 mV	X LDPE Tubing &	Silicon X OTHER	t: Weir Area
pH 6.55	UNITS	110 1117	Notes: At location F	P7-18R	
,	- CHITO		Notes. At location 1	12 1011	
SEDIMENT DATA SEDIMENT SAMPLE START DEPTH	TYPE OF SEDIMEN	r	EQUIPMENT FOR COLLECT	TION DECON FLUIDS USED	
END DEPTH	ORG		HAND AUGER	DI WATER	
TYPE OF SAMPLE GRAB	SANE		S.S. SPOON	POTABLE WATER	
SAMPLE OBSERVATIONS	GRAV	EL	ALUMINIUM PAN	LIQUINOX	
ODOR	CLAY		DREDGE	OTHER	
COLOR	OTHE	R	OTHER		
FLOC OBSERVED	CLEAR OF LEA	LITTER	<u>—</u>		
ANALYTICAL PARAMETERS SURFACE WATER	METHO)	PRESERVATION	VOLUME SAMPI	LE
X Ammonia-Nitrogen	<u>NUMBE</u>			REQUIRED COLLEC	<u>TED</u>
X Ammonia-Nitrogen X Nitrate / Nitrite	<u>10-107-0</u> 300.0	6-1 N N		1 X 250 mL X 1 X 500 mL X	
X Chloride	300.0	N		1 X 500 mL X	!
X Sulfate	300.0	N	4 DEG. C	1 X 500 mL X	
X Specific Conductivity X Total Al, Cr, Na	SM 2510 Total 60			1 X 500 mL X 1 X 500 mL X	
X Dissolved Al, Cr, Na	DIS. 601			1 X 500 mL X	
ANALYTICAL PARAMETERS					
SEDIMENT	METH <u>NUM</u> E		PRESERVATION <u>METHOD</u>	VOLUME SAMPI REQUIRED COLLEC	
% Solids / Moisture	160.3	<u></u>		1 X 8 oz.	<u>TEU</u>
Total Al, Cr, Fe	Total 60	0B	4 DEG. C	1 X 8 oz.	
		<u></u>			
Ⅰ		<u></u>		∐	
		<u>—</u>		<u> </u>	
		<u> </u>			
NOTES DUP/ MS/ MSD Collect	ted				
					Wood.
SIGNATURE: Field Fo	rm w/ Signature on File				Sampled by: BEG
					Prepared by: SAM Checked by: CTM

WOOD ENVIRONMENT & INFRAST	RUCTURE SOLUTIONS, INC.			PAGE 1 OF 1		
FIELD DATA RECORD - S	URFACE WATER					
PROJECT OLIN CHEMICAL SUPERFUN	ND SITE, WILMINGTON, MA	JOB NUMBER 61	07190016	DATE 12/4/2018		
FIELD SAMPLE ID O	C-SW-SD17 ACTIVITY	TIME START 9:55	END 10:10	BOTTLE TIME 10:00		
QC SAMPLES COLLECTED	N/A					
SURFACE WATER DATA		EQUIPMENT USED	TYPE OF SURFACE	WATER		
WATER DEPTH	SPEC. COND	BEAKER	X STREAM/ DI			
AT LOCATION 7 in		mS/cm PACS BOMB	LAKE/ PONI			
DEPTH OF SAMPLE FROM SURFACE 3 ir	D.O. 12.18 mg/L	X PERISTALTIC PU	_	POTABLE WATER		
TEMPERATURE	SALINITY	X FILTER (0.45 mic	ron) MARSH	NONE		
6.19 DEG C	%	X LDPE Tubing & Si	icon X OTHER Sou	uth Ditch		
TURBIDITY ORP 29.8 NTU 131 mV						
pH 6.20 UNITS		Notes: Up-stream of I	ocation PZ-17RRR			
SEDIMENT DATA						
SEDIMENT SAMPLE START DEPTH	TYPE OF SEDIMENT	EQUIPMENT FOR COLLECTION	I DECON FLUIDS USED			
END DEPTH	ORGANIC	HAND AUGER	DI WATER			
TYPE OF SAMPLE GRAB	SAND	S.S. SPOON	POTABLE WATER			
SAMPLE OBSERVATIONS	GRAVEL	ALUMINIUM PAN	LIQUINOX			
ODOR	CLAY	DREDGE	OTHER			
COLOR	OTHER	OTHER	_			
FLOC OBSERVED	_ CLEAR OF LEAF LITTER _					
ANALYTICAL PARAMETERS SURFACE WATER	METHOD	PRESERVATION V	OLUME SAMPLE			
X Ammonia-Nitrogen	<u>NUMBER</u> <u>FIL</u> 10-107-06-1		COLLECTED COLLECTED X 250 mL X			
X Nitrate / Nitrite	300.0		K 500 mL X			
X Chloride X Sulfate	300.0		K 500 mL X			
X Sulfate Specific Conductivity	300.0 SM 2510B		X 500 mL X X			
X Total Al, Cr, Na	Total 6010B		K 500 mL X X			
X Dissolved Al, Cr, Na	DIS. 6010B		K 500 mL X			
			———			
ANALYTICAL PARAMETERS						
SEDIMENT	METHOD <u>NUMBER</u>		OLUME SAMPLE <u>EQUIRED</u> <u>COLLECTED</u>			
% Solids / Moisture	160.3		(8 oz.			
Total Al, Cr, Fe	Total 6010B	4 DEG. C 12	(8 oz.			
l						
		 -				
I H		 -				
NOTES						
				wood.		
SIGNATURE: Field Form w/ Sign	ature on File			Sampled by: BEG		
				Prepared by: SAM Checked by: CTM		

WOOD ENVIRONMENT & INFRAST	TRUCTURE SOLUT	IONS, INC.			PAGE 1 OF 1
FIELD DATA RECORD - S	EDIMENT				
PROJECT OLIN CHEMICAL SUPERFI	UND SITE, WILMINGTOR	N, MA JOB N	NUMBER 6	6107190016	DATE 12/4/2018
FIELD SAMPLE ID	OC-SD1	ACTIVITY TIME	START 11:25	END 11:35	BOTTLE TIME 11:30
QC SAMPLES COLLECTED	MS/ MSD				
SURFACE WATER DATA		-	EQUIPMENT USED	TYPE OF SURFA	CE WATER
WATER DEPTH	SPEC. COND		BEAKER	STREAM	RIVER DECON FLUIDS USED:
AT LOCATION	ft.	μs/cr	PACS BOMB	LAKE/ PC	ND DI WATER
DEPTH OF SAMPLE FROM SURFACE	ft. D.O.	mg/L	PERISTALTIC P	PUMP SEEP	POTABLE WATER
TEMPERATURE DEG C	SALINITY	%	FILTER (0.45 m	nicron) MARSH	NONE
TURBIDITY	ORP	76	LDPE Tubing &	Silicon OTHER_	
NTU		mV			
pH UNITS					
SEDIMENT DATA					
SEDIMENT SAMPLE START DEPTH 0.0) ft. TYPE OF SEDIM	MENT	EQUIPMENT FOR COLL	LECTIC DECON FLUIDS USE	D
END DEPTH 0.5	5 ft. X ORG	GANIC	X HAND AUGER	X DI WATER	
	X X X SAN		S.S. SPOON	POTABLE WATE	R
SAMPLE OBSERVATIONS	X GR/		S.S. BOWL	X LIQUINOX	
ODOR Mild	CLA		DREDGE OTHER	OTHER	
COLOR <u>Dark Brown</u> FLOC OBSERVED	CLEAR OF LEA			VATIONS	
ANALYTICAL PARAMETERS					
SURFACE WATER	METHO NUMBE			VOLUME SAMPLE REQUIRED COLLECTI	
Ammonia-Nitrogen	10-107-			1 X 250 mL	
Nitrate / Nitrite Chloride	300.0 300.0	N N		1 X 500 mL 1 X 500 mL	
Sulfate	300.0	N N		1 X 500 mL	
Specific Conductivity Total Al, Cr, Na	SM 2510 Total 60			1 X 500 mL	
Dissolved Al, Cr, Na	DIS. 601	10B Y	HNO3 / 4 DEG. C	1 X 500 mL	
ANALYTICAL PARAMETERS SEDIMENT	METH	40D	PRESERVATION	VOLUME SAMPLE	:
	<u>NUM</u>		METHOD F	REQUIRED COLLECTE	
X Solids / Moisture X Total Al, Cr, Fe	160.3 6010B		4 DEG. C	1 X 4 oz. X	
		<u> </u>			
│ □ ──					
 					
NOTES MS/ MSD Collected					اء ۔ ۔ ۔ ا
SD-1 location mostly mud					wood.
SIGNATURE: Field Form w/ Signature:	gnature on File				Sampled by: BEG
					Prepared by: SAM Checked by: CTM

WOOD ENVIRONMENT & INFRA	STRUCTURE SOLUTION	ONS, INC.			PAGE 1 OF 1
FIELD DATA RECORD -	SEDIMENT				
PROJECT OLIN CHEMICAL SUPER	RFUND SITE, WILMINGTON	, MA JOB N	IUMBER 6	107190016	DATE 12/4/2018
FIELD SAMPLE ID	OC-SD2	ACTIVITY TIME	START 11:40	END 11:50	BOTTLE TIME 11:45
QC SAMPLES COLLECTED	N/A				
SURFACE WATER DATA			EQUIPMENT USED	TYPE OF SURFAC	E WATER
WATER DEPTH	SPEC. COND		BEAKER	STREAM/	RIVER DECON FLUIDS USED:
AT LOCATION	ft.	μs/cm	PACS BOMB	LAKE/ PON	ID DI WATER
DEPTH OF SAMPLE FROM SURFACE	ft. D.O.	mg/L	PERISTALTIC PU	JMP SEEP	POTABLE WATER
TEMPERATURE DEG	SALINITY	%	FILTER (0.45 mi	cron) MARSH	NONE
TURBIDITY	ORP	/6	LDPE Tubing & S	Silicon OTHER	
N		mV			
pH UNITS					
SEDIMENT DATA					
SEDIMENT SAMPLE START DEPTH	0.0 ft. TYPE OF SEDIM	ENT	EQUIPMENT FOR COLL	ECTIC DECON FLUIDS USED)
END DEPTH	0.5 ft. X ORG	ANIC	X HAND AUGER	X DI WATER	
TYPE OF SAMPLE GRAB	X X SAN	D	S.S. SPOON	POTABLE WATER	
SAMPLE OBSERVATIONS	X GRA		S.S. BOWL	X LIQUINOX	
ODOR Mild	L CLA		DREDGE	OTHER	
COLOR <u>Dark Brown</u> FLOC OBSERVED	OTH	<u> </u>	OBSERV	ATIONS	
ANALYTICAL PARAMETERS		<u> 100 </u>		,	
SURFACE WATER	METHOI NUMBEI			VOLUME SAMPLE EQUIRED COLLECTE	D
Ammonia-Nitrogen	10-107-0	6-1 N	H2SO4 / 4 DEG. C 1	X 250 mL	_
Nitrate / Nitrite Chloride	300.0 300.0	N		X 500 mL X 500 mL	
Sulfate	300.0	N	4 DEG. C 1	X 500 mL	
Specific Conductivity Total Al, Cr, Na	SM 2510 Total 60			X 500 mL X 500 mL	
Dissolved Al, Cr, Na	DIS. 601			X 500 mL	
				———— <u>P</u>	
ANALYTICAL PARAMETERS		<u> </u>			
SEDIMENT	METH <u>NUM</u> E		METHOD R	VOLUME SAMPLE EQUIRED COLLECTE	<u>D</u>
X Solids / Moisture X Total Al, Cr, Fe	<u>160.3</u> 6010B		4 DEG. C 4 DEG. C	X 4 oz. X	
Total Al, OI, Te	00101		4 DEG. 0	X 4 02.	
NOTES					
MOTES					wood.

SIGNATURE: Field Form w/	Signature on File				
					Sampled by: BEG Prepared by: SAM
					Checked by: CTM

WOOD ENVIRONMENT & INFRASTRI	UCTURE SOLUTIO	NS, INC.				PAGE 1 OF 1
FIELD DATA RECORD - SEI	DIMENT					
PROJECT OLIN CHEMICAL SUPERFUNI	O SITE, WILMINGTON, I	MA JOB N	JMBER	6107190016		DATE 12/4/2018
FIELD SAMPLE ID	OC-SD3	ACTIVITY TIME	START 11:50	END	12:00	BOTTLE TIME 11:55
QC SAMPLES COLLECTED	N/A					
SURFACE WATER DATA			EQUIPMENT USEI	D TYP	E OF SURFACE W	/ATER
WATER DEPTH	SPEC. COND		BEAKER		STREAM/ RIVE	R DECON FLUIDS USED:
AT LOCATION ft.	. L	μs/cm	PACS BOMB		LAKE/ POND	DI WATER
DEPTH OF SAMPLE FROM SURFACE ft.	D.O.	mg/L	PERISTALTIC	PUMP	SEEP	POTABLE WATER
TEMPERATURE DEG C	SALINITY	%	FILTER (0.45	micron)	MARSH	NONE
TURBIDITY	ORP	76	LDPE Tubing 8	& Silicon	OTHER	
NTU		mV				
pH UNITS						
SEDIMENT DATA						
SEDIMENT SAMPLE START DEPTH 0.0 ft.	TYPE OF SEDIME	NT	EQUIPMENT FOR CO	LLECTIC DECON	FLUIDS USED	
END DEPTH 0.5 ft.	X ORGA	NIC	X HAND AUGER	X DI W	ATER	
TYPE OF SAMPLE GRAB X	XSAND		S.S. SPOON	POT	ABLE WATER	
SAMPLE OBSERVATIONS	X GRAV	EL	S.S. BOWL	X LIQL		
ODOR Mild	CLAY	_	DREDGE	ОТН	ER	
COLOR <u>Dark Brown</u> FLOC OBSERVED	CLEAR OF LEAF L		OBSE	RVATIONS		
ANALYTICAL PARAMETERS		<u>100</u>				
SURFACE WATER	METHOD NUMBER	<u>FILTERED</u>	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	
Ammonia-Nitrogen	10-107-06-	1 N	H2SO4 / 4 DEG. C	1 X 250 mL		
Nitrate / Nitrite Chloride	300.0 300.0	NN	4 DEG. C 4 DEG. C	1 X 500 mL 1 X 500 mL	- H	
Sulfate	300.0	N	4 DEG. C	1 X 500 mL		
Specific Conductivity Total Al, Cr, Na	SM 2510B Total 6010	N	4 DEG. C HNO3 / 4 DEG. C	1 X 500 mL 1 X 500 mL	-	
Dissolved Al, Cr, Na	DIS. 6010E		HNO3 / 4 DEG. C	1 X 500 mL		
ANALYTICAL PARAMETERS	METUO	D.	DDECEDVATION	VOLUME	CAMDIE	
SEDIMENT	METHO NUMBE		PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	
X % Solids / Moisture X Total Al, Cr, Fe	160.3 6010B	<u></u>	4 DEG. C 4 DEG. C	1 X 4 oz.	X	
□					_ 🗆	
I □					_ 📙	
│ 		<u></u>			_	
NOTES					_	1
						wood.
SIGNATURE: Field Form w/ Signa	ture on File					Sampled by: PEC
						Sampled by: BEG Prepared by: SAM Checked by: CTM

WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS,	INC.			PAGE 1 OF 1
FIELD DATA RECORD - SEDIMENT				
PROJECT OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, M	A JOB NUME	BER 610719	0016	DATE 12/4/2018
FIELD SAMPLE ID OC-SD4	ACTIVITY TIME ST	TART 12:05 END	12:15	BOTTLE TIME 12:10
QC SAMPLES COLLECTED N/A				
SURFACE WATER DATA		EQUIPMENT USED	TYPE OF SURFACE	WATER
WATER DEPTH SPEC. COND		BEAKER	STREAM/ R	VER DECON FLUIDS USED:
AT LOCATION ft.	μs/cm	PACS BOMB	LAKE/ PONI	D DI WATER
DEPTH OF SAMPLE D.O. FROM SURFACE ft.	mg/L	PERISTALTIC PUMP	SEEP	POTABLE WATER
TEMPERATURE DEG C SALINITY	%	FILTER (0.45 micron)	MARSH	NONE
TURBIDITY ORP	76	LDPE Tubing & Silicon	OTHER	
NTU	mV			
pH UNITS				
SEDIMENT DATA				
SEDIMENT SAMPLE START DEPTH 0.0 ft. TYPE OF SEDIMEN	NT EC	QUIPMENT FOR COLLECTICE	DECON FLUIDS USED	
END DEPTH 0.5 ft. X ORGAI	NIC X	HAND AUGER	X DI WATER	
TYPE OF SAMPLE GRAB X SAND	Ļ	S.S. SPOON	POTABLE WATER	
SAMPLE OBSERVATIONS X GRAVE		i i	X LIQUINOX	
ODOR Mild CLAY COLOR Dark Brown OTHER	<u>_</u>	DREDGE OTHER	OTHER	
FLOC OBSERVED CLEAR OF LEAF L		OBSERVATIONS	-	
ANALYTICAL PARAMETERS		_		
SURFACE WATER METHOD NUMBER		RESERVATION VOLUMETHOD REQUIR		
Ammonia-Nitrogen 10-107-06-		2SO4 / 4 DEG. C 1 X 250 I DEG. C 1 X 500 I		
Nitrate / Nitrite 300.0 Chloride 300.0		DEG. C 1 X 500 i 1 X 500 i		
Sulfate 300.0		DEG. C 1 X 500 i		
Specific Conductivity SM 2510B Total AI, Cr, Na Total 60108		DEG. C 1 X 500 I NO3 / 4 DEG. C 1 X 500 I		
Dissolved Al, Cr, Na DIS. 6010B	1H Y	NO3 / 4 DEG. C 1 X 500 i		
	=			
ANALYTICAL PARAMETERS SEDIMENT METHOI) P	RESERVATION VOLUM	E SAMPLE	
NUMBER NUMBER	<u>3</u>	METHOD REQUIR DEG. C		
X Total Al, Cr, Fe 6010B		DEG. C 1 X 4 oz.		
<u> </u>			—— <u> </u>	
 	_		H	
	-			
NOTES				wood
				wood.
SIGNATURE: Field Form w/ Signature on File	<u> </u>			Sampled by: BEG
				Prepared by: SAM Checked by: CTM

WOOD ENVIRONMENT & INFRASTRU	JCTURE SOLUTION	NS, INC.				PAGE 1 OF 1
FIELD DATA RECORD - SEI	DIMENT					
PROJECT OLIN CHEMICAL SUPERFUND	O SITE, WILMINGTON, N	//A JOB N	UMBER	6107190016		DATE 12/4/2018
FIELD SAMPLE ID	OC-SD5	ACTIVITY TIME	START 12:20	END	12:30	BOTTLE TIME 12:25
QC SAMPLES COLLECTED	DUP					
SURFACE WATER DATA			EQUIPMENT USE	D TYP	E OF SURFACE V	VATER
WATER DEPTH	SPEC. COND		BEAKER		STREAM/ RIVE	ER DECON FLUIDS USED:
AT LOCATION ft.		μs/cm	PACS BOMB		LAKE/ POND	DI WATER
DEPTH OF SAMPLE FROM SURFACE ft.	D.O.	mg/L	PERISTALTIC	PUMP	SEEP	POTABLE WATER
TEMPERATURE DEG C	SALINITY	%	FILTER (0.45	micron)	MARSH	NONE
TURBIDITY	ORP	70	LDPE Tubing 8	& Silicon	OTHER	
NTU		mV				
pH UNITS						
SEDIMENT DATA						
SEDIMENT SAMPLE START DEPTH 0.0 ft.	TYPE OF SEDIMEN	NT	EQUIPMENT FOR CO	DLLECTIC DECON	FLUIDS USED	
END DEPTH 0.5 ft.	X ORGAN	NIC	X HAND AUGER	X DI W	ATER	
TYPE OF SAMPLE GRAB X	X SAND		S.S. SPOON	POT	ABLE WATER	
SAMPLE OBSERVATIONS	X GRAVE	EL	S.S. BOWL	X LIQU	JINOX	
ODOR Mild	CLAY		DREDGE	ОТН	IER	
COLOR <u>Dark Brown</u>	OTHER	' <u></u>	OTHER			
FLOC OBSERVED	_ CLEAR OF LEAF L	ITTER <u>Yes</u>	OBSE	RVATIONS		
ANALYTICAL PARAMETERS SURFACE WATER	METHOD		PRESERVATION	VOLUME	SAMPLE	
Ammonia-Nitrogen	<u>NUMBER</u> 10-107-06-	<u>FILTERED</u> 1 N	METHOD H2SO4 / 4 DEG. C	REQUIRED 1 X 250 mL	COLLECTED	
Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL		
Chloride Sulfate	300.0 300.0	NN	4 DEG. C 4 DEG. C	1 X 500 mL 1 X 500 mL	- -	
Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL		
Total Al, Cr, Na Dissolved Al, Cr, Na	<u>Total 60108</u> DIS. 6010B		HNO3 / 4 DEG. C	1 X 500 mL 1 X 500 mL	- H	
Bissolved Al, OI, IVa	<u> </u>		1111007 4 BEG. 0	TX 300 IIIL	_ 🗒	
					_ 🗆	
ANALYTICAL PARAMETERS SEDIMENT	METHO		PRESERVATION	VOLUME	SAMPLE	
X % Solids / Moisture	<u>NUMBEF</u> 160.3	<u>3</u>	<u>METHOD</u> 4 DEG. C	REQUIRED	COLLECTED X	
X Total Al, Cr, Fe	6010B	<u> </u>	4 DEG. C	1 X 4 oz.	X	
l 📙 ———		<u> </u>			_ 📙	
					_	
					- 片	
		_				
NOTES DUP Collected						wood
						wood.
SIGNATURE: Field Form w/ Signat	ture on File	_				Sampled by: BEG
						Prepared by: SAM Checked by: CTM

wood.

Appendix B

Chain of Custody Records

10 Hazelwood Drive

Amherst, NY 14228-2298 Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

360325-Boston



Client Information	Phone: 97	· Que	han	A Mas	on, Be	cky C	;				Carrier	Ti			COC No: 480-121082-2469	95.1
Client Contact: Mr. Brian Guichard	Phone: 97	8658	8612	/ E-Ma	iil ky.masi	on@i	testar	meric	cainc.	com			20		Page: Page 1 of 3	
Company: Olin Corporation									An	alvsis R	eauest	eu 480	0-145365 C	oc -	Job #:	
Address:	Due Date Request	ted:								ŤΤ	İT	T	\Box	111	Preservation Code	es:
51 Eames street City: Wilmington State, Zip:	TAT Requested (d	ays):													C - Zn Acetate D - Nitric Acid	M - Hexane N - None O - AsNaO2 P - Na2O4S
MA, 01887 Phone:	PO#.				日								111	1	E - NaHSO4 F - MeOH	Q - Na2SO3 R - Na2S2O3
423-336-4012(Tel)	REWI0025				(0)											S - H2SO4 T - TSP Dodecahydrate
Email: beguichard@olin.com	WO.#.				s or No	te			9.					2	J - Ice J - DI Water	U - Acetone V - MCAA
Project Name Olin Groundwater Semi-Annual	Project # 48006612				yes or	& Sulfa	Ammonia	ö	Conductance			į		containe	K - EDTA L - EDA	W - pH 4-5 Z - other (specify)
Site: Massachusetts	SSOW#				Samp SD (Chloride	, Ami	¥,	CCon				111	o jo	Other:	
Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W-water, S-solid O-waste/oll, BT=Tissue, A-Alr)	Field Filtered Perform MS/N	300.0_28D - Ch	350.1 - Nitrogen,	6010MCP - Diss.	2510B - Specific					Total Number	Special Ins	structions/Note:
Campio racitation	><	><	The same of the sa	ation Code:	XX	N	1000	D	N			ill jū		X	- Openial in a	ti dottorio i di
OC-GW-10S	11-15-18	8:20	6	Water	1	1	1	1	1					4		
OC-GW-201S	11-15-18		6	Water	1	1	1	1	1					4		
OC-GW-24	1175-16	10:15	6	Water	1	1	1	1	1					4		
OC-CW-28				Water										13		
OC-GW-34D	11-15-18	11,40	6	Water	1	1	1	1	1					4		
OC-GW-34SR	11-15-18			Water	1	1	1	1	1					4		
OC-GW-35S	11-15-18		6	Water	4	1	1	1	1					4		
OC CW-425				Water												
00-0W-43SR				Water												
OC-GW-76S	1H5-18	8:55	6	Water	4	1	1	1	1					4		
OC-GW-CA-1	11-15-18	8:55	6	Water	1	1	1	1	1					4		
Possible Hazard Identification Non-Hazard Flammable Skin Irritant Pois					Sa										ed longer than 1	
Non-Hazard Flammable Skin Irritant Pois Deliverable Requested: I, II, III, IV, Other (specify)	on B Unkn	own - R	Radiological		Sp				Client ns/Q0	Requirer	Disposa nents:	al By L	ab	Archi	ive For	Months
Empty Kit Relinquished by:		Date:			Time:	-	_				TA.	Method o	of Shipment			
Relinquished by.	Date/Tyne:	.0		Company		Rece	Poevis	бу)			Date/Time:		125	Company
Relinquished by:	Date/Time			Company			enved t		1	To	1		Date/Time:	1-18	7350	Company
Relinquished by:	Dafertime:	18	150	Company			aived t		7	Vetre	pon	<u>c</u>	Date/Time:	6-1	P 0600	Company
Custody Seals Intact: Custody Seal No.:						Cool	er Ten	npera	ture(s)	°C and Othe	r Remarks		2.0		1	#0

10 Hazelwood Drive

Amherst, NY 14228-2298

Chain of Custody Record



Phone (716) 691-2600 Fax (716) 691-7991														THE LEADER IN ENVIR	DISHER THE THE THE
Client Information	Brian	Gric	har	A Mas	on, Be	cky (2				Carrier T	racking No(s)	Ÿ.	COC No: 480-121082-24695	2
Client Contact Mr. Brian Guichard	Phone: 97	865	861	⊋/ E-Ma beck		on@	testa	merio	cainc.co	m				Page Page 2 of 3	
Company. Olin Corporation									Ana	ysis Re	queste	d		Job#.	
Address	Due Date Request	ed:			層					TT				Preservation Codes:	
51 Eames street City Wilmington	TAT Requested (d	ays):	-											B - NaOH N C - Zn Acetate O	- Hexane - None - AsNaO2
State, Zip: MA, 01887										1 1				E - NaHSO4 Q	- Na2O4S - Na2SO3 - Na2S2O3
Phone: 423-336-4012(Tel)	PO#: REWI0025				(0									G - Amchlor S H - Ascorbic Acid T	- H2SO4 - TSP Dodecahydrate
Email. beguichard@olin.com	WO #.				s or No	ate			9				2	J - Di Water V	- Acetone - MCAA
Project Name. Olin Groundwater Semi-Annual	Project # 48006612				es or	S Sulfa	nonia		Conductance				containe		- pH 4-5 - other (specify)
Site; Massachusetts	SSOW#				Sampl SD (Y	oride a	ı, Ammonia	Al, Cr					10	Other:	
Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid O=wastefoil, BT=Tissue, A=Air)	Field Filtered Perform MS/N	300.0 28D - Chi	350.1 - Nitrogen,	6010MCP - Diss.	2510B - Specific				Total Number	Special Instr	uctions/Note:
	><	><	Preserv	ation Code:	\boxtimes	N	S	D	N						
DUP Gen 202D	11-14-18	8:45	6	Water	1	1	1	1	1				١	A	
Gw 202 PMS	11-14-18	8:45	1	Water	1	1	1	ì	1				4	1	
Gw 2020 MSD	11-14-18	8:45		Water	V	1	1	1)				4		
OC-GW-202S	11-1478	9:55		Water	1	1	1	1	1				4		
OC-202D	11-14-18			Water	И		1	1	1				4		
OC-GW-25	11-15-18	9:40		Water	4	l	1	1	1				4		
OC-GW-78S	11-14-18	9:50		Water	4	1	1	(1				4		
OC-GW-79S	11-14-18	11:00		Water	1	1	1	(1				4		
OC-PZ16RRR	11-14-18	11:30		Water	1	1	1	١	1				4		
OC-PZ-17RRR	11-14-18	10:35	1/	Water	1	1	1	1	1				4		
OC-PZ18R	11-14-18	10150	V	Water	X	1	1	1	1				4		
Possible Hazard Identification Non-Hazard Flammable Skin Irritant Pois Deliverable Requested: I, II, III, IV, Other (specify)	on B Unkno	own \square_R	adiologica			□ _F	Returr	То	Client		Disposal			ned longer than 1 m	Months
Empty Kit Relinquished by:		Date:			Time:						Me	thod of Shipm			
Relinquishedeby	Date/Time: 17-15-18	3		Company		Rec	eived	Dy-)	,	,	Date	Time. F1570		ompany *
Relinquished by	Date/Time:	ref	180	Company			o e o		- V	Elica	ion	Date	Time AP		ompany
Relinquished by.	Date/Time:	-		Company	- 8		eived t						/Time:	Carlo.	ompany
Custody Seals Intact: Custody Seal No.: Δ Yes Δ No						Coo	ler Ter	mpera	iture(s) °C	and Other	Remarks:	1.0		A) er 08/04/2016

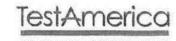
Page 40 of 40

TestAmerica Buffalo

10 Hazelwood Drive

Amherst, NY 14228-2298

Chain of Custody Record



Phone (716) 691-2600 Fax (716) 691-7991 BRIAN Cuchard Carrier Tracking No(s). Mason, Becky C 480-121082-24695.3 Client Information Client Contact: 9786586121 becky.mason@testamericainc.com Mr. Brian Guichard Page 3 of 3 Company Job# **Analysis Requested** Olin Corporation Due Date Requested: Address: Preservation Codes: 51 Eames street M - Hexane TAT Requested (days) B - NaOH N - None Wilmington C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na204S State, Zip: E - NaHSO4 Q - Na2SO3 MA, 01887 F - MeOH R - Na25203 Phone: G - Amchior S-H2SO4 423-336-4012(Tel) **REWI0025** H - Ascorbic Acid T - TSP Dodecahydrate WO# 1-lce U - Acetone V-MCAA J - DI Water beguichard@olin.com W - pH 4-5 K-EDTA Project Name Project #: L-EDA Z - other (specify) 48006612 Olin Groundwater Semi-Annual ပ် SSOW# Other: A. Massachusetts of 6010MCP - Diss. Number Sample Matrix Type Total Sample (C=comp, O=waste/oil, Sample Identification Sample Date G=grab) BT=Tissue, A=Air Special Instructions/Note: Preservation Code: 9:15 OC-PZ-24 Water OC-PZ-25 11-14-18 Water Water Water MSD Water Water Water Possible Hazard Identification Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological Disposal By Lab Return To Client Months Deliverable Requested: I, II, III, IV, Other (specify) Special Instructions/QC Requirements: Method of Shipment Empty Kit Relinquished by Time: Company Relinquished by Relinquished by Company Custody Seal No. Custody Seals Intact: Cooler Temperature(s) °C and Other Remarks: Δ Yes Δ No

Ver: 08/04/2016











O1

w 4

10 Hazelwood Drive Amherst, NY 14228-2298 Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

36WJ25-Banton



Client Information	Sampler BRIVAN (Trush	m]	Lab	PM: son, Be	ecky (c					Carri	er Tra	cking I	No(s):			COC No: 480-121082-24695	K8/4/8
Client Contact:	Phone:	<u> </u>		E-M	ail			maria	naina			1						Page:	100
Mr. Brian Guichard Company:				bec	ky.mas	sonu	lesia	menc			-	_	_	_	_		-	Page 1 of 3 Job#:	82.3 %
Olin Corporation	10				-	_	_	_	Ar	alysis	Re	ques	ted	_			_		480-145916 CO
Address: 51 Eames street	Due Date Request	ed:												1		1		Preservation Codes: A - HCL M	- Hexane
City: Wilmington	TAT Requested (d	ays):																B - NaOH N C - Zn Acetate O	- None - AsNaO2 - Na2O4S
State, Zip: MA, 01887					製器													E - NaHSO4 Q	- Na2SO3 - Na2SO3
Phone: 423-336-4012(Tel)	PO#: REWI0025				6												.0	G - Amchlor S H - Ascorbic Acid T	H2SO4 TSP Dodecahydrate
Email; beguichard@olin.com	WO #;				Yes or N	te			9.								2	J - Ice U J - DI Water V	- Acetone - MCAA
Project Name: Olin Groundwater Semi-Annual	Project #: 48006612				e (Yes	& Sulfate	onia		Conductance								containers		- pH 4-5 other (specify)
Site: Massachusetts	SSOW#:				Sampl		Amm,	. Al, Cr			1			1			of cor	Other:	
		Sample	Sample Type (C≃comp,	Matrix (W=water, &=soli	밀	300.0_28D - Chloride	350.1 - Nitrogen	6010MCP - Diss	2510B - Specific								Total Number		
Sample Identification	Sample Date	Time	G=grab)	ation Code:	Julia d	4	-	1	Z 25	-	-	1000	and a				5	Special Instr	uctions/Note:
OC-ISW 108		\sim	rieseiva	Water	M	N	S	D	N	Mark No.			56%	3430		51 550			
GG GW 2015				Water	+	+	+			+	1			1	+	+			
08-GW24				Water	Ħ	+				+						+	100		
00 GW-26				Water	T	T													-
06-CW-34D				Water	II														
OC-GW 34SR				Water															
96-GW-35S				Water	П												居		
OC-GW-428 (mp) portis)	11-28-18	9:45		Water	4	1	1	1	1								4		
OC-GW-43SR	11-28-18	8:40	G	Water	1	1	1	1	1								4		
OC.GW 766				Water															
OC-GW-6A-1				Water													15		
Possible Hazard Identification Non-Hazard Flammable Skin Irritant Deliverable Requested: I, II, III, IV, Other (specify)	Poison B Unkno	own \square_{F}	Radiological			\Box_{μ}	Retur	n To (Clien			Dispo	ssed sal B			are re	Archi	ed longer than 1 m	onth) Months
Empty Kit Retinquished by:		Date:			Time	:	_	_	_		_	_	Meth	od of S	Shipmen	t			
Relinquished by.	Date/Time:	7 a		Company		Rec	ceived	by.	7	1	_				Date/Tin	ne:	0-	TE IN C	ompany
Relinquished by:	Date/Time:	-28-	180	Company		Red	ceived	by:	MAA	11/	14/	0	IK.	14	Date/Tin	ne [] [20	9/180160	Implany TA
Relinquished by:	Date/Time:			Company		Red	ceived	by: U	/WVI	VVV I	100			_	Date/Tin	ne:			ompany
Custody Seals Intact: Custody Seal No.: Δ Yes Δ No						Cod	oler Te	mpera	ture(s)	°C and	Other F	temark	(S:		3.	2 =	HI	ICE	

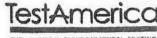
10 Hazelwood Drive Amherst, NY 14228-2298

Chain of Custody Record



TestAmerica

Phone (716) 691-2600 Fax (716) 691-7991																	_	THE ELADER IN ENVIRO	MADEL PATRICE STREET
Client Information	Sampler	m	was	Mas Mas	м: on, В	ecky	С						Carrie	r Trackir	ng No(s):			COC No: 480-121082-24695.2	2
Client Contact: Mr. Brian Guichard	Phone: G	7865	1861	a / E-Ma	HC:			tame	rical	nc.co	om							Page: Page 2 of 3	
Company. Olin Corporation	0				Ĺ				_		lysis	Rec	ues	ed			\Box	Job#:	
Address:	Due Date Request	ted:			18		T	T	T	T	Ť	П		T	TT	T	18	Preservation Codes:	
51 Eames street City: Wilmington	TAT Requested (d	lays):																B - NaOH N - I	Hexane None AsNaO2
State, Zip: MA, 01887					1000													D - Nitric Acid P - I E - NaHSO4 Q -	Na2O4S Na2SO3 Na2S2O3
Phone: 423-336-4012(Tel)	PO#: REWI0025													1				G - Amchior S - I	H2SO4 TSP Dodecahydrate
Email: beguichard@olin.com	WO#:				s or No	(ON	are		0	2							Si	J - Ice U - J - DI Water V - I	Acetone MCAA - pH 4-5
Project Name: Olin Groundwater Semi-Annual	Project #: 48006612				e (Ye	S OF	ing a	ollig o	- Land	uctar						- 1	containe		other (specify)
Site Massachusetts	SSOW#				ampl	200	Amm	A IA	1 3								of con	Other:	
Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (Wewater, 6-solid, O-wastefoli, BT-Tissue, A-Air)	Field Filtered S	And a 280 - Chlorid	_	ANTOMOD - Dise									Total Number	Special Instru	ctions/Note:
120	1 300		\$1000 (H-2) - H-5	ation Code	Y	N	S	D	N	10 10		100	20100	1001-00	2 (204		X	Again views	
DUPGW 43 SR	11-28-18	8:40	G	Water	1	-	(11		1	+	+	\vdash	+	+	+	4		
C10, 43 51 MS	11-98-18	8:40	6	Water		1	4	1	1	1	-	-		-	4-1	_	4		
GW43 XC MSD	11-78-18	8:40	6	Water	1	1	1	1			_						4		
OC-GW-2028				Water															
OC 202D				Water															
OC-9W-25				Water															
OS-GW-78S				Water	П														
OC-GW-798				Water	П														
OC-PZIERRR				Water	П	T	T										K		
OC PZ-17RRR				Water	П				T		T								
OC PZ18R				Water	П		T		T					T					
Possible Hazard Identification Non-Hazard Flammable Skin Irritant Po Deliverable Requested: I, II, III, IV, Other (specify)	ison B Unkn	own \square_F	Radiological				Retu	ırn T	o Clie	ent	e may		ispos	sed if s al By L			1	red longer than 1 mo	onth) Months
		Date:			Time		_		-	_	_			dethod (of Shipme	euj.	_		
Empty Kit Relinquished by: Relinquished by:	Date/Time:		100	Company	1		ceive	d by:	-	7	-	-			Date/		-	Cor	mpany
Relinquished by	Date/Time:	P-18		Company	-	Re	scelve	d.be	1	7		1	۸	- 1	Date/	//-	48	11-1981	mpany
Le res	Date/Time:	18 -	1800	0					W	W	Wo	W	Cir	colk		11	12	7110 P1991	17
Relinquisherby	Date/Time:			Company		Re	ceive	d by:							Date/	Time:		Con	mpany
Custody Seals Intact: Custody Seal No.: Δ Yes Δ No						Co	ooler 1	Tempe	rature	e(s) °C	and O	ther R	emarks	ž.	(3.2	7	#1 TCE	



ט ט		
3		
S		
2		
Š		
J		

<u></u>	٥
_	ì
Q	0
N	5
\sim	כ
_	١
α	0

Phone (716) 691-2600 Fax (716) 691-7991	Sampler:			Lab	PM:	-			_		-	Carrier T	racking	No(s):	_	COC No:	
Client Information	BRIM	and	SSAN	Ma	son, Be	cky (76.				Comor	aoni ng	10(0).		480-1210	
lient Contact: //r. James Cashwell	Sampler:	65 BL	1610	E-M	aii: ky.mas	on@	testa	meric	ainc	com						Page: Page 1 of	Market _
ompany: Olin Corporation									Ar	alys	is Re	queste	d			Job #;	4
ddress: PO BOX 248	Due Date Request	ed:								T		TT	M			Preservation	480-145765 COC
ity: Charleston	TAT Requested (d	ays):														A - HCL B - NaOH C - Zn Acetate	0 - AsNaO2
late, Zip: N, 37310-0248																D - Nitric Acid E - NaHSO4	P - Na2O45 Q - Na2SO3
hone:	PO#:						1			1						F - MeOH G - Amchior	R - Na2S2O3 S - H2SO4
23-336-4012(Tel) mail:	WO #:				- No				- 1	EF					C 400	H - Ascorbic Acid	T - TSP Dodecahydrat U - Acetone
mcashwell@olin.com troject Name;	Project #:				- Sel		_			NDPA/BEHP					ners	J - DI Water K - EDTA L - EDA	V - MCAA W - pH 4-5
Din Willington AnnualPlant B Event Desc: Plant B quarterly(Marc					Tres		solvec		Ps	OC NC	135	100 3			conta	Other:	Z - other (specify)
Massachusetts	33071#.			464	MSD MSD	Į.	n Diss		CTM	- SVOC	Į.		1 3		rofo		19.
		Sample	Sample Type (C=comp,	Matrix (w-water, 8-soli	d Filtered	1 - Ammo	6010MCP - Iro	MAVPH - VPH	8260MCP - VO	8270_LL_MCP	SM4500_H+ - pH				al Numbe		
ample Identification	Sample Date	Time	G=grab)	O=waste/oil, BT=Tissue, A=Air	原	350.1				COLUMN TWO	Mary Mary				Total	Special In	structions/Note:
	\sim	\sim	Preservi	ation Code:	XX	S	D	A	Α.	N. A	99		100	22 300	X	The Market Control	
OC 8-03"		1		Water	1	1	1	2	2	+	+	+	H	+			
OC-GW-101	11-27-18	10.05		Water	17	11	1	3	3	2	4	+	H	+	11		<i></i>
OC CW 18				Water	1	+	-	7		-	-	++	H	-H	10	10	with the same
OC-IW-10	11-27-18			Water	17	11	1	-	3	2	1	++	-	+	11		
OC-IW-6	11-07-18	10.00		Water	14	1	1	3	3	3	4	++	H	+	11	8	
06-GW-16 R		· · ·		Water	+	-	-	\vdash	4	+	+	+	\vdash	+	- 50		
OC-OW-HOR-MS				Water	#	-		\vdash	-	+	+	1	\vdash				
DC-GW-16R-M6D				Water	11	-			-	4	1	11	H	11			
(- 68	Water	1	-			-	1	-	11		-			
			7799	Water	4	_			4	+	+	1	19	\dashv			
				8.8	Ц	1		Щ		\perp	1				理		
Possible Hazard Identification Non-Hazard Flammable Skin Irritant Poiso Deliverable Requested: I, II, III, IV, Other (specify)	on B Unkno	own \square_R	adiological	,		\square_{κ}	eturn	TOC	lient		uireme	Disposal i	g if sai	mples are	Arch	ned longer than nive For	Months
mpty Kit Relinquished by:		Date:			Time:	-		-	_		-		hod of S	Shipment:			
elinquishea/by:	Date/Time:			Company	1		elved b	oy:	-	_	1	_	7	Date/Time:	7.75	a /r	Company
elinquisted by	Date/Time:			Company		Rece	Devis		2	_	4	0		Date/Time:	11/2	1	Company
reling(dishearty)	Date/Time:	0	/re	Company		Refe	elved b	000	Or.	4	Vel	love		Date/Time:	1/20	1/18 0/	Company
	- A 570 DAY 170									-							
Custody Seals Intact: Custody Seal No.:						Cool	er Ten	nperatu	ire(s)	"C and	Other	Remarks:	1	9		#/	

Amherst, NY 14228-2298

10 Hazelwood Drive

350325-Boston

Chain of Custody Record

360325-Boston

<u>TestAmerica</u>

THE LEADER IN ENVIRONS THE TESTING

Phone (716) 691-2600 Fax (716) 691-7991												-						THE CEADER IN ENVIRON
Client Information	Sampler: 32	MAN	and	Lab F Mas	on, Be	ecky (С	70					amer 1	rackir	ig No(s	6):		COC No: 480-122051-28004.1
Client Contact: Mr. Brian Guichard	Phone: 97	8658	612	É-Ma beci	ky.mas	son@	testa	merio	cainc.	.com								Page: Page 1 of 1
Company: Olin Corporation									An	naly	sis R	equ	este	d				Job#:
Address: 51 Eames street	Due Date Reques	ted:					T						T	T	T		136	Preservation Codes: 480-145767
City: Wilmington	TAT Requested (c	days):			Mark Street						1							A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2
State, Zlp: MA, 01887					Sec.						-			1				D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3
Phone: 423-336-4012(Tel)	PO#: REWI0025				2												11	F - MeOH
Email: beguichard@olin.com	WO#:		. A.		or No			7	1st		1						2	I - Ice U - Acetone J - DI Water V - MCAA
Project Name: Olin Chemical Wilmington MA	Project #: 48006612	7			es or	onia		8260 Olin list	- SVOC Olin List		1						of container	K - EDTA W - pH 4-5 L - EDA Z - other (specify)
Site: Massachusetts	SSOW#:				Samp SD (Y	, Ammonia	¥	8260	SVOC	ЕРН					3		of cor	Other:
Sample Identification	Sample Date	Sample Time		Matrix (W=wpter, B=solid, O=waste/of, BT=Tissue, A=Air) ation Code:	Field Filtered	0 350.1 - Nitrogen,	MAVPH - MA VF	8260MCP - VOC	8270_LL_MCP	MAEPH - MA EF	200		AST THE	No. Acet	i abo		Total Number	
21.1-(11-2778	10100	/	Water	7	1	3	3	2	2	THE COLUMN	577 5		1000	1	11/21/4/20	-	
1W-6 GW 101	11-3778		G	Water	H	1	3	3		2	+	+	+	+	t	+	11	
	11-37-18		6	Water	+	1	3	3	3	3	+	+	+	+	+	1	11	1557 To 1557
1W -10	11-07-73	13:15	6		H	1	1	2	0	0	+	+	+	+	+	\forall	- 11	A STATE OF THE STA
			—		H	-		-		1	+	+	+	+	+	\vdash	100	
					100						1	1	1	1			13	
					40	11-						1		T			125	
												1					100	
							-											
																	100	,
																	2.72	
Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Pois	on B Unkno	own \square_R	Radiological		1	\neg _R	eturn	To C	Client			Disp	osal	d if s By La	ample ab	es are	retain Archi	ed longer than 1 month) ive For Months
Deliverable Requested: I, II, III, IV, Other (specify)					Spi	ecial	Instru	uction	ns/QC	C Red	quiren	nents						
Empty Kit Relinquished by:		Date:			Time:								Met	lhod o	Shipm			
Relinquished by:	Date/Time -37	-18		Company		Rece	eived b	Y	-	/	7	_			Date/	Time: /, 2	2	14 146 Company
Relinquished by	Date/Time:	18	1800	Company		Rece		The state of the s	2		16	60	שנו	n	Date	Time:	18/	P OVO Company
Relinquished by	Date/Time:	-	,	Company		Rece	ived b	y:						, -	Date	Time:	/	Company
Custody Seals intact: Custody Seal No.:	701-22-1	10011-00-0	11/11/11	TOTAL PARTY	E HITTER	Coole	er Tem	peratu	ire(s)	°C and	d Other	Rema	arks:	2				#1
					-	_	-		-			-		_	_			Ver: 08/04/2016

12/19/2018

Page 60 of 60









CI

o N

10 Hazelwood Drive

Amherst, NY 14228-2298

Chain of Custody Record

360325-Boston



Ver: 08/04/2016

THE LEADER IN ENVIRY

Sampler	^	7	Lab	PM:	_	_	_	-	-	_	Carrier Track	ing No(s):		COC No:	PART
BRIAN (such	and	Ma	son, Be	cky C	:								480-121085-24697	0.000
Phone: 97	8658	1610			on@t	estar	nerica	inc.c	com					Page 1 of 1	अप ।
								Ana	alys	is Re	quested			Job#.	480-145914
Due Date Request	ted:				T			T	Ť	T	III		100		480-145914
TAT Requested (d	lays):			100	1							111			f - Hexane I - None
-					1							1.1			- AsNaO2 - Na2O4S
					1										- Na2SO3 - Na2S2O3
PO#.				0	1			1							- H2SO4 - TSP Dodecahydra
WO #:				7218					BEH			1 1	90		I - Acetone ' - MCAA
Project #:		111111111111		(Yes	1	P			DPA				alner	K-EDTA V L-EDA Z	V - pH 4-5 - other (specify)
48006612 SSOW#:			-	Nple		solve		Ps	OC N				cont	Other:	on the first of th
				d Sar	nia	ō		CT	. Sv	Hd.			Lo Lo		
Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oll, BT=Tissue, A=Air	Field Filtere	350.1 - Ammo	6010MCP - Iro	маурн - урн	8260MCP - VC	8270_LL_MCF	SM4500_H+-			Total Numbe	Special Insti	ructions/Note:
><	><			XX	s	D	AA	Married World	N	80			X		
11-28-18	9:15	G-	Water	1	1	1	3	3	21				11		
			Water												
7			Water	Π											
11-28-18	10:40	6	Water	1	1	1	3	3	2	1			11		
			Water												
11-28-18	9145	G	Water	1	1	1	3	3	2	1			11		
11-28-18	9:45	G	Water	1	1	1	3	3	2	1			11		
11-28-18	9:45	6	Water	1	1	1	3	_	_	1			11		
11-28-18	9:45	6	Water	4	1	1	3	3	7	1			11		
			Water												
				1	mole	Dier	neal.	(A 6	inc m	av bo	accorred if	samples a	ro rotain	and langur than 1 m	onth)
son B Unki	nown 🗆	Radiologica	1	38					ee m						Months
-1111				Sp	-	Name and Address of the Owner, where		MINISTER STATE	Requ						Marie Allendar and A
	Date:		TO SECURIT	Time					-		Method	of Shipment.			
Date/Time:	28-10		Company		Rece	lved b	y:		-	-	- Australia	Date/Time	26 /	£ /111 C	ompany
Date/Time:	- 0 / 8		Company		Rece	ived b	y. A	T.	6	1	(A., 1	Date/Time	1100	list didie	ompany
Date/Time:	18		Company	-	Rece	ived b	V	VM	W	Non	LIKO	Date/Time	1120		ompany
					1.000							Duis, and		9	
	Due Date Request TAT Requested (d PO#: WO #: Project #: 48006612 SSOW#: Sample Date 11-28-18 11-28-18 11-28-18 11-28-18 Unki	Due Date Requested: TAT Requested (days): PO#: WO#: Project #: 48006612 SSOW#: Sample Date Time 11-28-18 9:45 11-28-18 9:45 11-28-18 9:45 11-28-18 9:45 11-28-18 9:45 11-28-18 9:45 11-28-18 9:45 Date: Date/Time: 11-24-18	Due Date Requested: TAT Requested (days): PO#: WO #: Project #: 48006612 SSOW#: Sample Type (C=comp, G=grab) Preserva 11-28-18 9:45 G- 11-28 9:45 G- 11-	Due Date Requested: TAT Requested (days): PO#: WO #: Project #: 48006612 SSOW#: Sample Type (C=comp, G=grab) BT-TISSUE, A-ALI Preservation Code: Water Due Date Requested: TAT Requested (days): PO#: WO #: Project #: 48006612 SSOW#: Sample Type (C=comp, G=grab) aT=Tissue, A-Au) Butter Preservation Code: Water Company Date/Time: Company Company Company Company Company	Mason, Becky Company Mason, Becky Company	Mason, Becky C E-Mail: becky, mason@testar becky, mason@te	Mason, Becky C E-Mail: becky mason@testamerica becky mason@testamerica becky mason@testamerica	Mason, Becky C E-Mail: becky, mason@testamericainc.com becky, maso	Mason, Becky C E-Mail: becky: mason@testamericainc.com	Mason, Becky C E-Mail: becky mason@testamericainc.com	## Mason, Becky C Finore G S S S S S S S S S	Mason, Becky C E-Mail: E-Mail:	Mason, Becky C Mason Becky C Mason Becky C Mason Becky mas	Mason, Becky C	

5

12/13/2018

Page 33 of 33

10 Hazelwood Drive

Amherst, NY 14228-2298

Chain of Custody Record

360325-Boston

The same	_1	A	-		-
100	CT		ne	21.16	
10	217	17	11	11 14	mer for

Phone (716) 691-2600 Fax (716) 691-7991											0000ZJ-D	02(01)		THE LEADER IN ENVIRONMENTAL TESTING
Client Information	Sampler Av	O GMC	hard	Lab F Mas	PM: son, E	Beck	y C		Same places		Carrier Track	ing No(s):		COC No: 480-121083-22978.1
Client Contact: Mr. Brian Guichard	Phone: 786	586	12/	E-Ma	ail:	ason	@test	amer	ricain	c.com				Page: Page 1 of 1
Company: Olin Corporation		200	.0_/		Í		0.00		and a second desired		sis Requested		_	Job#:
Address: 51 Eames street	Due Date Reques	ted:					T	T	T	lary	sis requested		2010	Preservat
City: Wilmington State, Zip: MA, 01887	TAT Requested (c	days):		,										A - HCL B - NaOH C - Zn Ac D - Nitric E - NaHS
Phone: 423-336-4012(Tel)	PO #: REWI0025				(6)									F - MeOli G - Amch. 480-146199 COr H - Ascorbic Acia
Email: beguichard@olin.com	WO #;				o o	No)	Chloride	Calc					EUE.	I - Ice U - Acetone J - DI Water V - MCAA
Project Name: Olin Wilmington Surface Water Qurarterly	Project #: 48006612				e (Xe	SS OF	onia	itrate	N.	Cr, Na			containers	K - EDTA W - pH 4-5 L - EDA Z - other (specify)
Site: Massachusetts	SSOW#:				ampl	SD (Y	Amm	rite, N	Al, Cr,	AI, Cr			of con	Other:
Sample Identification	Sample Date	Sample Time	Type (C=comp, o G=grab)	Matrix water, S=solid =waste/oil, Tissue, A=Air	Field Filtered S	Perform MS/MS	350.1 - Nitrogen,	2510B, 353.2 Nitrite, Nitrate Calc	6010MCP - Diss. Al,				Total Number o	Special Instructions/Note:
OC-ISCO1	12 4 0	><	Preservation	Alle Septimination	X	Xs	N	N	D	D			X	
OC-ISCO2	12-4-18	11:15	0-	Water	1	+	1 1	19	-11	1			6	
96-ISC03_		8:50		Water	17	+	111	7	1	1)			6	
			0	Water	\mathbb{H}	+	#	+	_	-			营	
OC-PZ-16RRRSW		9.15	0	Water	11	4	1	Li	7 1	1			6	
OC-PZ-17RRRSW		9:40	-	Water	14	1	11	10	1 5	1			6	
OC-PZ-18RSW	-	10:25		Water	14		1	2	11	1			6	
OC-SD-17		10,00		Water	1		11	0	21	1			6	
DUP 72-18RSW PZ-18RSW MS		10:25	6	Water	14		11	10	7 1	1			6	
PZ-18 RSW MS		10:05	6	Water	1		11	â	7 1	1			6	
P2-18 nsw msh	I W	10:05	6	V	1		1	1 6	2 1	1			6	
Possible Hazard Identification Non-Hazard Flammable Skin Irritant Po Deliverable Requested: I, II, III, IV, Other (specify)	ison B Unkr	nown □	Radiological		+		Retu	urn T	o Clie	ent	may be assessed in Disposal By equirements:	f samples are ret	tain	ed longer than 1 month) ive For Months
Empty Kit Relinquished by:		Date:			Tin	ne:				_	Metho	d of Shipment:		ney
Relinquished by:	Date/Time: /2-y-/	-4-181	(1310 Con	mpany mpany				ed by:	1	Ne E	esone	Date/Time:	5	
Relinquished by: Custody Seals Intact: Custody Seal No.:	Date/Time:		Co	mpany			Receive Cooler			e(s) °C	and Other Remarks:	Date/Time:		Company
A Yes A No												20		1















10 Hazelwood Drive

Amherst, NY 14228-2298 Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

360325-Boston

<u>TestAmerica</u>

THE LEADER IN ENVI

Client Information	Sample BR NP	n an	chard		on, Beck	y C		Carrier Track	ng No(s):	4	COC No: 480-121084-11110	
Client Contact: Mr. Brian Guichard	Phone 978	658	6121	E-Mail beck		@testa	mericainc.com				Page: Page 1 of 1	200
Company: Olin Corporation							Analys	is Requested		_	lob#:	480-146179 COC
Address	Due Date Reques	ted:						T T T	TITI	F	Preservation Codes:	_
51 Eames street City: Wilmington	TAT Requested (o	days):								E	B - NaOH N C - Zn Acetate O	- Hexane - None - AsNaO2
State, Zip: MA, 01887									1 1 1	E	E - NaHSO4 Q	- Na2O4S - Na2SO3
Phone: 423-336-4012(Tel)	PO#: REWI0025					1					G - Amchlor S	- Na2S2O3 - H2SO4 - TSP Dodecahydrate
Email: beguichard@olin.com	WO#				Yes or No or No)					8	I - Ice U J - DI Water V	- Acetone - MCAA V- pH 4-5
Project Name: Olin Chemical Annual Sediment	Project #: 48006612				es or		1 1 1 1		1 1 1			- other (specify)
Site: Massachusetts	SSOW#				Sample (SD (Yes	ture				of COI	Other:	
Comple Identification	Sample Date	Sample Time	Type (C=comp, (W=w	Matrix vater, S=solid, =waste/oil,	MS/W	6010MCP, Moisture				Total Number	Special lasts	
Sample Identification	Sample Date	> Inne	G=grab) BT=T Preservation		K AK A	V V				Ż	Special Instr	ructions/Note:
OC-SD1	12-4-15	11:30	G	Solid		1				1		
OC-SD2	1	11:45	1	Solid		1				1		
OC-SD3		11:55		Solid		1				1		
OC-SD4		12:10		Solid		1				1		
OC-SD5		12:25		Solid		1				1		
oc-SD-I -MS		11:30		Solid		1				1		
oc- <u>51) - 1 -</u> MSD		11:30		Solid		1				1		
OC-SD DUP		12:25	V	Solid		1				1		
				Solid								
Possible Hazard Identification Non-Hazard Flammable Skin Irritant	Poison B Unkn	П.					posal (A fee m To Client	ay be assessed if	samples are reta	ained	d longer than 1 m	
Deliverable Requested: I, II, III, IV, Other (specify)	Poison B Unkn	own	Radiological				uctions/QC Rec	Disposal By quirements:	Lab Ar	rchive	a For	Months
Empty Kit Relipquished by:		Date:			Time:	-		Method	of Shipment:			
Relinquished by:	Date Time:	-y-18	13% Com	pany		Received	2 1 1	,	Date/Time:	14	1342	ompany
Relinquished by:	Date/Time:	15	Mes of	ipany	6	Bortynd	ay Vall	conna	Date/Time:	1	P 8/00	ompany
Relinquished by:	Date/Time:	1	Com	pany	F	Received			Date/Time:	7 4		ompany
Custody Seals Intact: Custody Seal No.:					C	Cooler Ter	mperature(s) °C and	d Other Remarks: 6	.2	1	# 1	-

wood.

Appendix C

Cap Inspection Log

	Olin Wilmington Co		Temporary Cap Inspection
Date: 11 /	16 / 2018	Inspector:	Brian Guichard
Inspection Checklis	st		
Feature	Observation		Notes
Drain	Clear and Functioning	Requires Maintenance	Date Cleared:
Sewn Seams	Intact	Requires Repairs	Date Repaired:
Ballast	Intact	Requires Replacement	Date Replaced:
Panels	X Repair Locations		Date:
Ballest Locations	O Locations Replaced	or Repaired	SEAM REPAIR needed
Seam Locations	Locations Repaired		PAten Areas not holding

Note: A large portion of repairs done earlier in the season do not seem to be adhering to the cap surface sufficiently.

Patches completed on the older sections of the cap do not stick because of the thread bare areas around the patch, and a few of the patches on the newer section of the cap do not seem to adhere to the newer cap material because it is thin and flimsy and not a smooth surface to bond to. Smaller puncture hole patches seem to be faring a bit better.

wood.

Appendix A2

First Quarter 2019 Sampling Event



Interim Response Steps Field Activity Report First Quarter 2019 Sampling Event

Olin Chemical Superfund Site Wilmington, Massachusetts Project 6107190016

Prepared for:



Interim Response Steps Field Activity Report First Quarter 2019 Sampling Event

Olin Chemical Superfund Site Wilmington, Massachusetts

Project 6107190016

Prepared for:

Olin Corporation 3855 North Ocoee St., Suite 200, Cleveland, TN 37312

Prepared by:

Wood Environment & Infrastructure Solutions, Inc. 271 Mill Road 3rd Floor Chelmsford, MA 01824 USA

1-Jul-19

T: 978-692-9090

Prepared and Reviewed by:

Peter H. Thompson

Senior Principal Hydrogeologist

Michael J. Murphy Principal Scientist

My Murphy

Copyright and non-disclosure notice

The contents and layout of this report are subject to copyright owned by Wood (© Wood Environment & Infrastructure Solutions, Inc.). save to the extent that copyright has been legally assigned by us to another party or is used by Wood under license. To the extent that we own the copyright in this report, it may not be copied or used without our prior written agreement for any purpose other than the purpose indicated in this report. The methodology (if any) contained in this report is provided to you in confidence and must not be disclosed or copied to third parties without the prior written agreement of Wood. Disclosure of that information may constitute an actionable breach of confidence or may otherwise prejudice our commercial interests. Any third party who obtains access to this report by any means will, in any event, be subject to the Third-Party Disclaimer set out below.

Third-party disclaimer

Any disclosure of this report to a third party is subject to this disclaimer. The report was prepared by Wood at the instruction of, and for use by, our client named on the front of the report. It does not in any way constitute advice to any third party who is able to access it by any means. Wood excludes to the fullest extent lawfully permitted all liability whatsoever for any loss or damage howsoever arising from reliance on the contents of this report. We do not however exclude our liability (if any) for personal injury or death resulting from our negligence, for fraud or any other matter in relation to which we cannot legally exclude liability.

Table of contents

1.0	Introd	duction				
	1.1 Limitations					
2.0	Slurry	Slurry Wall/Cap monitoring program2				
	2.1					
		2.1.1	Groundwater Level Measurement			
		2.1.2	Groundwater Sampling2			
		2.1.3	Surface Water Sampling			
		2.1.4	Data Logger Data Download			
		2.1.5 Cap Inspection				
3.0	Plant	B monitor	ing program5			
	3.1	1 Scope of Work5				
	3.1.1 Groundwater Level Measurements and LNAPL Gauging					
		3.1.2	Groundwater Sampling			
4.0	Refere	ences	6			
			List of tables			
Table 1		Groundw	ater and Surface Water Sampling Locations – Slurry Wall/Cap Monitoring Program			
Table 2 Groundwater and Surface Water Sampling Locations – Sturry Wall/Cap Monitoring Program						
Table 3			I Parameters for Groundwater Sampling – Slurry Wall/Cap Monitoring Program			
Table 4			ater Laboratory Analytical Program – Slurry Wall/Cap Monitoring Program			
Table 5			I Parameters for Surface Water Sampling – Slurry Wall/Cap Monitoring Program			
Table 6			/ater Laboratory Analytical Program – Slurry Wall/Cap Monitoring Program			
Table 7						
Table 8	5 5					
 Table 8 Final Field Parameters for Groundwater Sampling – Plant B Monitoring Program Table 9 Groundwater Laboratory Analytical Program – Plant B Monitoring Program 		. 3				
Table 3		Groundwa	ater Laboratory Analytical Program – Plant B Monitoring Program			
			List of figures			
			List of figures			
•		Slurry Wall/Cap Monitoring Program Sampling Locations				
		Plant B M	onitoring Program Sampling Locations			
			List of appendices			
Append						
Append	·					
Appendix C		Cap Inspection Logs				
			List of acronyms			
Amec Foster Whe		Vheeler	Amec Foster Wheeler Environment and Infrastructure, Inc.			
DO			Dissolved Oxygen			
IRSWP			Interim Response Steps Work Plan			
LNAPL			Light Non-Aqueous Phase Liquid			
MACTE	С		MACTEC Engineering and Consulting, Inc.			
NTU			Nephelometric Turbidity Units			
ORP			Oxidation/Reduction Potential			

Project 6107190016 | 7/1/2019 Page 1007190016 | Page 2007190016 | Page 20071900016 | Page 20071900016 | Page 20071900016 | Page 2007190001

RI/FS Remedial Investigation/Feasibility Study

SC Specific Conductivity

TAL TestAmerica Laboratories, Inc.

USEPA United States Environmental Protection Agency

UV Ultraviolet

6107190016

Wood Wood Environment & Infrastructure Solutions, Inc.



1.0 Introduction

On behalf of the Olin Corporation (Olin), Wood Environment & Infrastructure Solutions, Inc. (Wood) formerly Amec Foster Wheeler, presents this summary report for field activities completed in association with the First Quarter 2019 groundwater and surface water monitoring for the Slurry Wall/Cap Monitoring Program and the Plant B Monitoring Program. These activities were conducted consistent with the requirements and procedures contained in the Final Interim Response Steps Work Plan (IRSWP), Olin Chemical Superfund Site, 51 Eames Street, Wilmington, Massachusetts dated August 8, 2008 and the Volume IIIB, the Quality Assurance Project Plan, of the Final Remedial Investigation/Feasibility Study (RI/FS) Work Plan dated August 14, 2009 (MACTEC Engineering and Consulting, Inc. [MACTEC], 2009).

1.1 Limitations

This report, including its findings, opinions, and conclusions, is intended for the exclusive use and benefit of, and may be relied upon only by Olin Corporation and the United States Environmental Protection Agency (USEPA).



2.0 Slurry Wall/Cap monitoring program

The purpose of the Slurry Wall/Cap Monitoring Program is to monitor the concentrations of select constituents in groundwater and surface water in areas adjacent to and within the South Ditch of the former Olin Facility located at 51 Eames Street, Wilmington, Massachusetts.

The First Quarter 2019 groundwater and surface water monitoring program includes collecting groundwater level measurements from select monitoring wells and piezometers, collecting and analyzing groundwater samples from five monitoring wells and five piezometers, and collecting and analyzing surface water samples from seven locations within the East Ditch and South Ditch. Groundwater and surface water sample locations are listed in **Table 1** and shown on **Figure 1**. The groundwater and surface water sampling program is further described in the Final IRSWP (MACTEC, 2008), which has been approved by the USEPA.

2.1 Scope of Work

The Slurry Wall/Cap Monitoring Program for this sampling event consists of collecting groundwater level measurements in the vicinity of the South Ditch area; collecting and analyzing groundwater samples from the following monitoring wells: GW-25, GW-78S, GW-79S, GW-202S, and GW-202D; and piezometers: PZ-16RRR, PZ-17RRR, PZ-18R, PZ-24, and PZ-25; collecting and analyzing surface water samples from the following locations: ISCO-1, ISCO-2, ISCO-3, SD-17, PZ-16RRR, PZ-17RRR, and PZ-18R; and downloading water level and barometric pressure data from data loggers that have been installed in the following wells and piezometers: GW-10S, GW-35S, GW-CA1, GW-76S, GW-78S, GW-CA3S, GW-CA4S, PZ-24, PZ-25, and GW-6S. Monitoring wells, piezometers, and surface water sample locations are shown on **Figure 1**.

2.1.1 Groundwater Level Measurement

On April 5, 2019, Wood personnel completed a site reconnaissance of the monitoring well locations in the Slurry Wall/Cap Monitoring Program and collected groundwater level measurements. This included measuring depth to groundwater from 22 monitoring wells and piezometers using a water level meter. Groundwater level measurements and calculated groundwater elevations are summarized in **Table 2**.

2.1.2 Groundwater Sampling

On April 3 and 4, 2019, Wood personnel sampled groundwater from five monitoring wells and five piezometers using 2017 USEPA low stress (low flow) groundwater sampling methods.

Prior to low flow sampling, a YSI 556 multi-parameter water quality meter and Hach 2100Q turbidity meter were calibrated according to the instrument manufacturer's specifications using certified calibration solutions.

Groundwater was purged using an adjustable rate peristaltic pump along with dedicated tubing at each monitoring location. During sampling activities, the purged groundwater was continuously monitored using the multi-parameter water quality meter for pH, temperature, specific conductivity (SC), dissolved oxygen (DO), oxidation/reduction potential (ORP), and turbidity. Well purging continued at each location until these field parameters stabilized as indicated in Appendix A of the IRSWP.

Piezometer wells PZ-16RRR and PZ-17RRR went dry upon purging and could not be sampled by low flow methods. These wells were purged dry and sampled upon recovery, which is the alternative approved method. Samples collected by this method typically have elevated turbidity. The final low flow purging field parameter measurements are presented in **Table 3**. Field data records for each groundwater monitoring location are attached in **Appendix A**.

Upon stabilization of groundwater parameters, groundwater samples were collected by directly filling the laboratory prepared sample bottles. A 0.45-micron pore diameter filter was used to field filter groundwater for dissolved metal analysis in accordance with the IRSWP. The samples were placed on ice and transferred to TestAmerica Laboratories, Inc. (TAL) of Buffalo, New York, under chain-of-custody for chemical analyses as summarized in **Table 4**. Copies of the chain-of-custody documents are provided in **Appendix B**. Laboratory analytical data are presented in the July 2019 Semi-Annual Status Report.

Purged groundwater from each monitoring well was collected in collapsible plastic containers, transported to the Block House building, adjacent to the Plant B groundwater treatment building, and containerized in a secured 55-gallon drum. Olin characterizes and disposes of that material in accordance with applicable regulations.

2.1.3 Surface Water Sampling

On April 2, 2019, Wood personnel collected seven surface water samples from downstream to upstream from the East Ditch and South Ditch. The locations are identified as ISCO-3, ISCO-2, PZ-16RRR, PZ-17RRR, SD-17, PZ-18R, and ISCO-1 as shown on **Figure 1**.

Before field activities began, a YSI multi-parameter water quality meter and Hach turbidity meter were properly calibrated to monitor surface water quality parameters at each location.

At each of the seven field locations, surface water parameter measurements (pH, temperature, SC, ORP, DO, and turbidity) were collected. Readings were collected by directly submersing the YSI probe into the surface water until parameter stabilization. The final surface water field parameters are summarized in **Table 5**. Field data records from each surface water sample location are attached in **Appendix A**.

Filtered surface water samples (for dissolved metals analysis) were collected by submerging dedicated tubing attached to a peristaltic pump into the water column at a depth that minimized entraining floating or suspended sediment. The peristaltic pump provides positive pressure for field filtering the water through the 0.45-micron pore diameter filter for dissolved metal analysis.

Surface water samples were collected by directly filling the laboratory prepared glassware. The samples were then placed on ice for delivery to TAL of Buffalo, New York, under chain-of-custody for chemical analyses summarized in **Table 6**. Copies of the chain-of-custody documents are provided in **Appendix B**. Laboratory analytical data are presented in the July 2019 Semi-Annual Status Report.

2.1.4 Data Logger Data Download

Data loggers are deployed in 10 monitoring wells and piezometers: GW-10S, GW-35S, GW-CA1, GW-76S, GW-78S, GW-CA3S, GW-CA4S, PZ-24, PZ-25, and GW-6S, to continuously monitor groundwater elevation proximate to the cap area. Wood E&IS downloaded data from the 10 data loggers, along with data from the barometric pressure data logger deployed in GW-35S. Downloaded data from the loggers are presented in the July 2019 Semi-Annual Status Report.

2.1.5 Cap Inspection

The temporary cap is composed of ten large and three small scrim reinforced polyethylene sheets of 8 mil thickness. These sheets were factory fabricated with double welded seams from smaller, narrower panels. The seams between the large sheets were field fabricated by folding and sewing the edges of the sheets together with an ultraviolet (UV) -resistant thread. The original temporary cap was installed in 2001 and consisted of a 6-mil thick sheet. Due to deterioration of the 6-mil sheet, an 8-mil thick cover was installed directly over the 6-mil cover and re-ballasted with sand bags to resist wind uplift.

Since November 2016, Olin on-site personnel have been conducting the cap inspections and integrating the inspections with the maintenance repair activities. Olin has reduced the official inspection frequency from quarterly to semi-annually with informal inspections to continue to ensure that any potential significant issues are addressed in a timely fashion. The semi-annual cap inspection and maintenance field data record is included as **Appendix C** and is summarized in the July 2019 Semi-Annual Status Report (No. 24).



3.0 Plant B monitoring program

The purpose of the Plant B groundwater sampling and analysis program is to monitor groundwater quality at select monitoring wells and conduct gauging activities to determine groundwater elevations and light non-aqueous phase liquid (LNAPL) thickness.

3.1 Scope of Work

The First Quarter 2019 Plant B Monitoring Program consisted of measuring groundwater levels in 28 monitoring wells within the Plant B area, gauging LNAPL thickness in monitoring wells where LNAPL was observed, and USEPA low stress (low flow) groundwater sampling at monitoring well: GW-16R. Groundwater monitoring wells from the Plant B Monitoring Program are shown on **Figure 2**.

3.1.1 Groundwater Level Measurements and LNAPL Gauging

On April 5, 2019, Olin personnel completed a site reconnaissance of the monitoring well locations in the Plant B Monitoring Program and collected groundwater level measurements and LNAPL thickness measurements. Depth to groundwater was measured in 28 monitoring wells using a water interface probe. For wells with observed LNAPL, LNAPL thickness was measured using an oil/water interface probe. Groundwater level measurements, groundwater elevations, and LNAPL thickness measurements are summarized in **Table 7**.

3.1.2 Groundwater Sampling

On April 3, 2019, Wood personnel sampled groundwater from monitoring well GW-16R following the 2017 USEPA low stress (low flow) groundwater sampling method.

Prior to low flow sampling, a YSI multi-parameter water quality meter and Hach turbidity meter were calibrated according to the instrument manufacturer's specifications using certified calibration solutions.

Groundwater was purged using an adjustable rate peristaltic pump along with dedicated tubing at the sample location. During sampling activities, the purged groundwater was continuously monitored using the YSI multi-parameter water quality meter for pH, temperature, SC, DO, ORP, and turbidity. Well purging continued at the sample location until these field parameters stabilized as indicated in Appendix A of the IRSWP. The final low flow purging field parameter measurements are presented in **Table 8**. Field data records for each groundwater monitoring location are attached in **Appendix A**.

Upon groundwater parameter stabilization, groundwater samples were collected by directly filling the laboratory prepared glassware. The samples were placed on ice, and were transferred to TAL of Buffalo, New York, under chain-of-custody for chemical analyses as summarized in **Table 9**. Copies of the chain-of-custody documents are provided in **Appendix B**. Laboratory analytical data will be presented in the July 2019 Semi-Annual Status Report.

Purged groundwater from sampling activities was collected in collapsible plastic containers, transported to the Block House building, adjacent to the Plant B groundwater treatment building, and containerized in a secured 55-gallon drum. Olin characterizes and disposes of that material in accordance with applicable regulations.

4.0 References

MACTEC Engineering and Consulting, Inc. (MACTEC), August 8, 2008. Final Interim Response Steps Work Plan, Olin Chemical Superfund Site, Wilmington, Massachusetts.

MACTEC, August 14, 2009. Final RI/FS Work Plan, Olin Chemical Superfund Site, Wilmington, Massachusetts.





Tables

Table 1 Groundwater and Surface Water Sampling Locations Slurry Wall/Cap Monitoring Program First Quarter 2019 Sampling Event Olin Chemical Superfund Site

Olin Chemical Superfund Site Wilmington, Massachusetts

Groundwater	Surface Water
GW-25	ISCO1
GW-78S	ISCO2
GW-79S	ISCO3
GW-202S	PZ-16RRR
GW-202D	PZ-17RRR
PZ-16RRR #	PZ-18R
PZ-17RRR #	SD-17
PZ-18R	
PZ-24	
PZ-25	
GW-16R ^	

Notes:

- Piezometer replaced in South Ditch

^ - Plant B Monitoring Well

Prepared by: CTM 5/10/2019 Checked by: SAM 5/10/2019

Table 2 Groundwater Elevations Slurry Wall/Cap Monitoring Program First Quarter 2019 Sampling Event Olin Chemical Superfund Site Wilmington, Massachusetts

WELL ID	Reference Elevation	Depth to Water	Groundwater Elevation (3)	Notes	Date Measured
I.D.	(ft msl)	(ft)	(feet NGVD)		
GW-10S	89.79	8.29	81.50	TOC	4/5/2019
GW-24	83.43	2.07	81.36		4/5/2019
GW-25	85.97	4.92	81.05		4/5/2019
GW-26*	84.93	*		*	
GW-34D	90.36	7.59	82.77		4/5/2019
GW-34SR	89.13	6.29	82.84		4/5/2019
GW-35S	88.51	6.95	81.56		4/5/2019
GW-39 ^	83.64	3.13	80.51		4/5/2019
GW-42S**	84.18	**		**	
GW-43SR	87.86	6.30	81.56		4/5/2019
GW-55D	81.95	2.32	79.63		4/5/2019
GW-55S	81.70	1.90	79.80		4/5/2019
GW-76S	88.45	6.99	81.46	TOC	4/5/2019
GW-78S	84.89	4.20	80.69		4/5/2019
GW-79S	81.54	3.24	78.30		4/5/2019
GW-201S	83.29	3.39	79.90		4/5/2019
GW-202D	86.52	5.55	80.97		4/5/2019
GW-202S	86.97	6.18	80.79		4/5/2019
GW-CA1	88.01	6.52	81.49		4/5/2019
PZ-16RRR/IN	***	3.47			4/5/2019
PZ-16RRR/OUT (4)	***	3.60			4/5/2019
PZ-17RRR/IN	***	2.61			4/5/2019
PZ-17RRR/OUT (4)	***	3.50			4/5/2019
PZ-18R/IN	82.42	1.70	80.72		4/5/2019
PZ-18R/OUT (4)	82.42	1.91	80.51		4/5/2019
PZ-24	89.43	8.32	81.11		4/5/2019
PZ-25	88.90	8.03	80.87		4/5/2019

Notes:

(1) - Measurement from top of PVC. If no PVC, measurement from TOC

- (2) Collected using a Solinst water interface probe
- (3) Groundwater Elevation = Reference Elevation Depth to Water
- (4) Reported elevation of surface water adjacent to piezometer

TOC - Water level measurement taken from Top of Casing

- * Well removed for detention basin construction
- ** Well destroyed during paving
- *** Piezometer replaced in South Ditch. Not surveyed

NGVD - National Geodetic Vertical Datum

msl - mean sea level

ft - feet

NM - not measured

^ - Well heaving

Prepared by: CTM 5/10/2019 Checked by: SAM 5/10/2019

Table 3 Final Field Parameters for Groundwater Sampling Slurry Wall/Cap Monitoring Program First Quarter 2019 Sampling Event Olin Chemical Superfund Site

Wilmington, Massachusetts

Quarterly Slurry Wall/Cap Monitoring Well Samples							Quarterly Slurry Wall/Cap Piezometer Samples					
Location ID	GW-25	GW-78S	GW-79S	GW-202S	GW-202D	PZ-16RRR	PZ-17RRR	PZ-18R	PZ-24	PZ-25		
Date	4/4/2019	4/3/2019	4/4/2019	4/3/2019	4/3/2019	4/4/2019	4/3/2019	4/3/2019	4/3/2019	4/3/2019		
Depth to Water (ft)	5.10	4.24	3.22	6.05	5.45	3.79	Dry	2.64	8.22	7.89		
Temperature (°C)	8.64	9.36	5.05	7.99	8.90	5.72	14.10	6.35	7.34	8.49		
Specific Conductivity (µS/cm)	1,193	1,272	2,138	962	2,439	1,861	1,262	4,767	1,814	1,322		
pH (standard units)	7.10	6.74	6.38	6.13	5.04	6.60	7.02	6.35	6.61	6.36		
Dissolved Oxygen (mg/L)	1.88	1.24	5.67	0.70	0.92	2.97	6.65	0.97	2.07	1.52		
Turbidity (NTU)	2.42	5.63	7.26	3.91	75.4	2.47	21.7	6.63	3.45	3.51		
ORP (millivolts)	-73.0	101.5	44.0	68.2	69.8	20.8	-3.7	38.3	-5.2	65.2		

Notes:

ft - feet

 $\mu S/cm$ - microSiemens per centimeter mS/cm - milliSiemens per centimeter

1 μ S/cm = 0.001 mS/cm

mg/L - milligrams per liter

NTU - nephelometric turbidity units ORP - Oxidation/Reduction Potential

mV - millivolts

Dry = purged dry and sampled upon recovery

Prepared by: CTM 5/10/2019

Checked by: SAM 5/10/2019

Table 4 Groundwater Laboratory Analytical Program Slurry Wall/Cap Monitoring Program First Quarter 2019 Sampling Event Olin Chemical Superfund Site

Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Physical/Inorganic Parameters			
Ammonia-Nitrogen	EPA 350.1 (10-107-06-1-K)	0.10	mg/L
Chloride	EPA 300.0	0.28	mg/L
Specific Conductivity	SM18 2510B	1.0	μmhos/cm
Sulfate	EPA 300.0	0.35	mg/L
Filtered Metals			
Aluminum, filtered	SW846 6010B	60	μg/L
Chromium, filtered	SW846 6010B	1.0	μg/L

Prepared by: CTM 5/10/2019

Checked by: SAM 5/10/2019

Notes:

mg/L - milligrams per liter

μmhos/cm - micromhos per centimeter

 μ mhos/cm = μ S/cm (microSiemens per centimeter) 1 μ S/cm = 0.001 mS/cm (milliSiemens per centimeter)

μg/L - micrograms per liter

Table 5

Final Field Parameters for Surface Water Sampling Slurry Wall/Cap Monitoring Program First Quarter 2019 Sampling Event Olin Chemical Superfund Site Wilmington, Massachusetts

ISCO1	ISCO2	ISCO3	PZ-16RRR	PZ-17RRR	PZ-18R	SD-17
4/2/2019	4/2/2019	4/2/2019	4/2/2019	4/2/2019	4/2/2019	4/2/2019
0.30	0.25	0.30	0.20	0.25	0.30	0.20
8.57	9.07	14.34	10.41	9.85	9.10	10.13
1.967	887	1.054	1.020	1.041	2.254	1.044
6.28	6.24	6.82	6.07	5.95	5.94	5.90
						8.83
						1.99
						179.7
	0.30	4/2/2019 4/2/2019 0.30 0.25 8.57 9.07 1,967 887 6.28 6.24 11.15 12.40 2.10 4.45	4/2/2019 4/2/2019 4/2/2019 0.30 0.25 0.30 8.57 9.07 14.34 1,967 887 1,054 6.28 6.24 6.82 11.15 12.40 11.50 2.10 4.45 2.75	4/2/2019 4/2/2019 4/2/2019 4/2/2019 0.30 0.25 0.30 0.20 8.57 9.07 14.34 10.41 1,967 887 1,054 1,020 6.28 6.24 6.82 6.07 11.15 12.40 11.50 10.57 2.10 4.45 2.75 3.84	4/2/2019 4/2/2019 4/2/2019 4/2/2019 4/2/2019 0.30 0.25 0.30 0.20 0.25 8.57 9.07 14.34 10.41 9.85 1,967 887 1,054 1,020 1,041 6.28 6.24 6.82 6.07 5.95 11.15 12.40 11.50 10.57 11.13 2.10 4.45 2.75 3.84 2.08	4/2/2019 4/2/2019 4/2/2019 4/2/2019 4/2/2019 4/2/2019 4/2/2019 0.30 0.25 0.30 0.20 0.25 0.30 8.57 9.07 14.34 10.41 9.85 9.10 1,967 887 1,054 1,020 1,041 2,254 6.28 6.24 6.82 6.07 5.95 5.94 11.15 12.40 11.50 10.57 11.13 11.21 2.10 4.45 2.75 3.84 2.08 1.87

Prepared by: CTM 5/10/2019

Checked by: SAM 5/10/2019

Notes:

ft - feet

 $\mu S/cm \text{ - microSiemens per centimeter} \\ mS/cm \text{ - milliSiemens per centimeter}$

 $1 \mu S/cm = 0.001 mS/cm$ mg/L - milligrams per liter

NTU - nephelometric turbidity units ORP - Oxidation/Reduction Potential

mV - millivolts

Table 6 Surface Water Analytical Program Slurry Wall/Cap Monitoring Program First Quarter 2019 Sampling Event Olin Chemical Superfund Site Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Physical/Inorganic Parameters			
Ammonia-Nitrogen	EPA 350.1 (10-107-06-1-K)	0.10	mg/L
Nitrate	EPA 300.0	0.02	mg/L
Nitrite	EPA 300.0	0.02	mg/L
Chloride	EPA 300.0	0.28	mg/L
Specific Conductivity	SM18 2510B	1.0	μmhos/cm
Sulfate	EPA 300.0	0.35	mg/L
Total Metals			
Aluminum, Total	SW846 6010B	60	μg/L
Chromium, Total	SW846 6010B	1.0	μg/L
Sodium, Total	SW846 6010B	320	μg/L
Filtered Metals			
Aluminum, Filtered	SW846 6010B	60	μg/L
Chromium, Filtered	SW846 6010B	1.0	μg/L
Sodium, Filtered	SW846 6010B	320	μg/L

Notes: mg/L - milligrams per liter μ mhos/cm - micromhos per centimeter μ mhos/cm = μ S/cm (microSiemens per centimeter) 1 μ S/cm = 0.001 mS/cm (milliSiemens per centimeter) μ g/L - micrograms per liter Prepared by: CTM 5/10/2019

Table 7 Groundwater Elevations Plant B Monitoring Program First Quarter 2019 Sampling Event Olin Chemical Superfund Site Wilmington, Massachusetts

WELL ID	Reference	Depth to	Depth to	Product Thickness	Groundwater	Date
WELLID	Elevation (1)	Water (2)	Product (3)	(4)	Elevation (5)	Measured
I.D.	(ft msl)	(ft)	(ft)	(ft)	(feet NGVD)	
B-2	90.48	11.46	NPD	NA	79.02	4/5/2019
B-3	90.32	10.82	NPD	NA	79.50	4/5/2019
B-5R	91.38	11.13	NPD	NA	80.25	4/5/2019
B-7A	88.81	7.71	NPD	NA	81.10	4/5/2019
B-17	91.55	9.11	NPD	NA	82.44	4/5/2019
GW-13	90.57	11.15	NPD	NA	79.42	4/5/2019
GW-14	88.70	8.95	NPD	NA	79.75	4/5/2019
GW-15	90.01	8.22	NPD	NA	81.79	4/5/2019
GW-16R	92.46	10.52	NPD	NA	81.94	4/5/2019
GW-23	91.04	11.57	11.55	0.02	79.49	4/5/2019
GW-52S	87.95	8.24	NPD	NA	79.71	4/5/2019
GW-100	90.15	11.14	NPD	NA	79.01	4/5/2019
GW-101	90.14	11.14	NPD	NA	79.00	4/5/2019
GW-102	89.00	10.01	NPD	NA	78.99	4/5/2019
IW-1	90.71	11.23	NPD	NA	79.48	4/5/2019
IW-2	90.53	11.20	NPD	NA	79.33	4/5/2019
IW-3	90.76	11.35	NPD	NA	79.41	4/5/2019
IW-6	89.15	10.31	NPD	NA	78.84	4/5/2019
IW-7	90.10	11.03	NPD	NA	79.07	4/5/2019
IW-8	89.94	10.87	NPD	NA	79.07	4/5/2019
IW-9	89.78	10.63	NPD	NA	79.15	4/5/2019
IW-10	90.43	11.29	NPD	NA	79.14	4/5/2019
IW-11	89.92	10.89	NPD	NA	79.03	4/5/2019
IW-12	90.31	11.33	NPD	NA	78.98	4/5/2019
IW-13	89.90	10.68	NPD	NA	79.22	4/5/2019
PID	89.97	10.89	NPD	NA	79.08	4/5/2019
P5	90.45	11.28	11.27	0.01	79.18	4/5/2019
12-IN	89.84	10.50	NPD	NA	79.34	4/5/2019

Prepared by: CTM 5/10/2019

Checked by: SAM 5/10/2019

Notes:

(1) - Reference elevations surveyed 11/97. New TOC survey by Dana Perkins 4-5/98

(2) - Top of PVC. If no PVC, measurement from top of steel casing

- (3) Collected using a Solinst water interface probe or Geotech oil/water interface probe
- (4) If sheen is noted, a product thickness of 0.01 feet will be used to calculate the groundwater elevation
- (5) Groundwater Elevation = Reference Elevation (Depth to Water (Product Thickness x 0.95))

TOC - Top of Casing

NPD - No Product Detected

NA - Not Applicable

NGVD - National Geodetic Vertical Datum

msl - mean sea level

ft - feet

East Ditch - No sheen noted; Observed OK

Table 8

Final Field Parameters for Groundwater Sampling Plant B Monitoring Program First Quarter 2019 Sampling Event Olin Chemical Superfund Site Wilmington, Massachusetts

Plant B Monitoring Well Samples	
Location	GW-16R
Date	4/3/2019
Depth to Water (ft)	10.82
Deptit to water (it)	10.02
Temperature (°C)	7.71
Specific Conductivity (μS/cm)	184
pH (standard units)	6.39
Dissolved oxygen (mg/L)	0.72
Turbidity (NTU)	9.47
Tarbianty (1410)	0.17
Oxidation Reduction Potential (mV)	18.6

Notes:

ft - feet

Prepared by: CTM 5/10/2019 Checked by: SAM 5/10/2019

 $\mu S/cm$ - microSiemens per centimeter mS/cm - milliSiemens per centimeter

 $1~\mu\text{S/cm} = 0.001~\text{mS/cm}$

mg/L - milligrams per liter

NTU - nephelometric turbidity units ORP - Oxidation/Reduction Potential

m)/ millivelte

mV - millivolts

Table 9 Groundwater Laboratory Analytical Program Plant B Monitoring Program First Quarter 2019 Sampling Event Olin Chemical Superfund Site Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Volatile organic compounds (VOC)			
2,4,4-Trimethyl-1-pentene	SW846 8260B	0.40	μg/L
2,4,4-Trimethyl-2-pentene	SW846 8260B	0.43	μg/L
Semivolatile organic compounds (SVOC)			
N-nitrosodiphenylamine	SW846 8270C	0.07	μg/L
bis(2-ethylhexyl)phthalate	SW846 8270C	0.42	μg/L
Volatile Petroleum Hydrocarbons (VPH)			
C5-C8 Aliphatics	MA VPH	1.5	μg/L
C5-C8 Aliphatics, Unadjusted	MA VPH	1.5	μg/L
C9-C12 Aliphatics	MA VPH	1.5	μg/L
C9-C12 Aliphatics, Unadjusted	MA VPH	1.5	μg/L
C9-C10 Aromatics	MA VPH	0.50	μg/L
Methyl-tert-butyl-ether (MTBE)	MA VPH	0.25	μg/L
Benzene	MA VPH	0.25	μg/L
Ethylbenzene	MA VPH	0.25	μg/L
m,p-Xylene	MA VPH	0.50	μg/L
o-Xylene	MA VPH	0.25	μg/L
Toluene	MA VPH	0.25	μg/L
Naphthalene	MA VPH	0.25	μg/L
Physical/Inorganic Parameters			
Ammonia-Nitrogen	EPA 350.1	0.10	mg/L
Ammonia-Nitrogen	(10-107-06-1-K)	0.10	IIIg/L
рН	SM 4500 H+ B	0.10	SU
Filtered Metals			
Iron, Filtered	SW846 6010B	19	μg/L

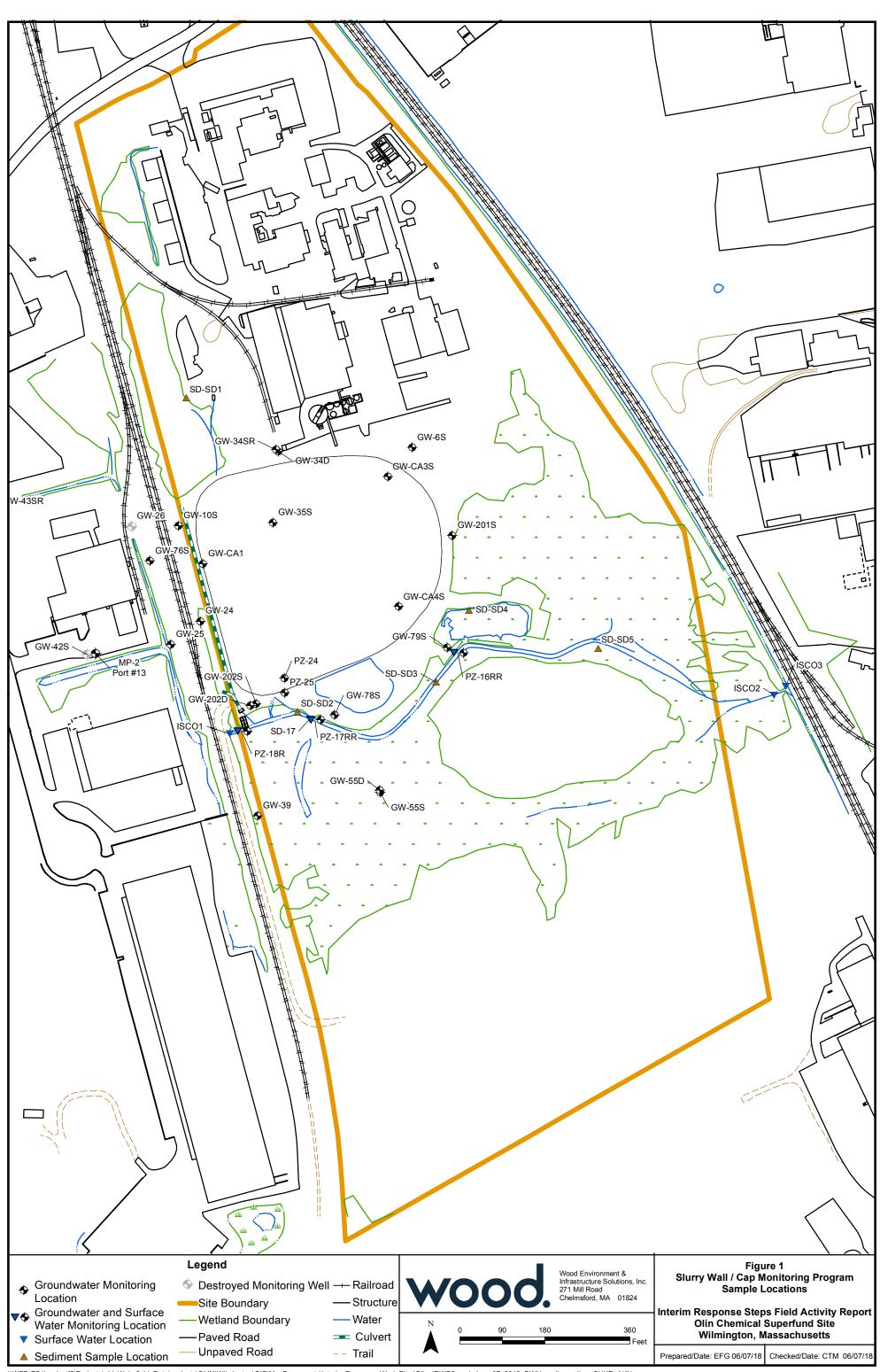
Prepared by: CTM 5/10/2019

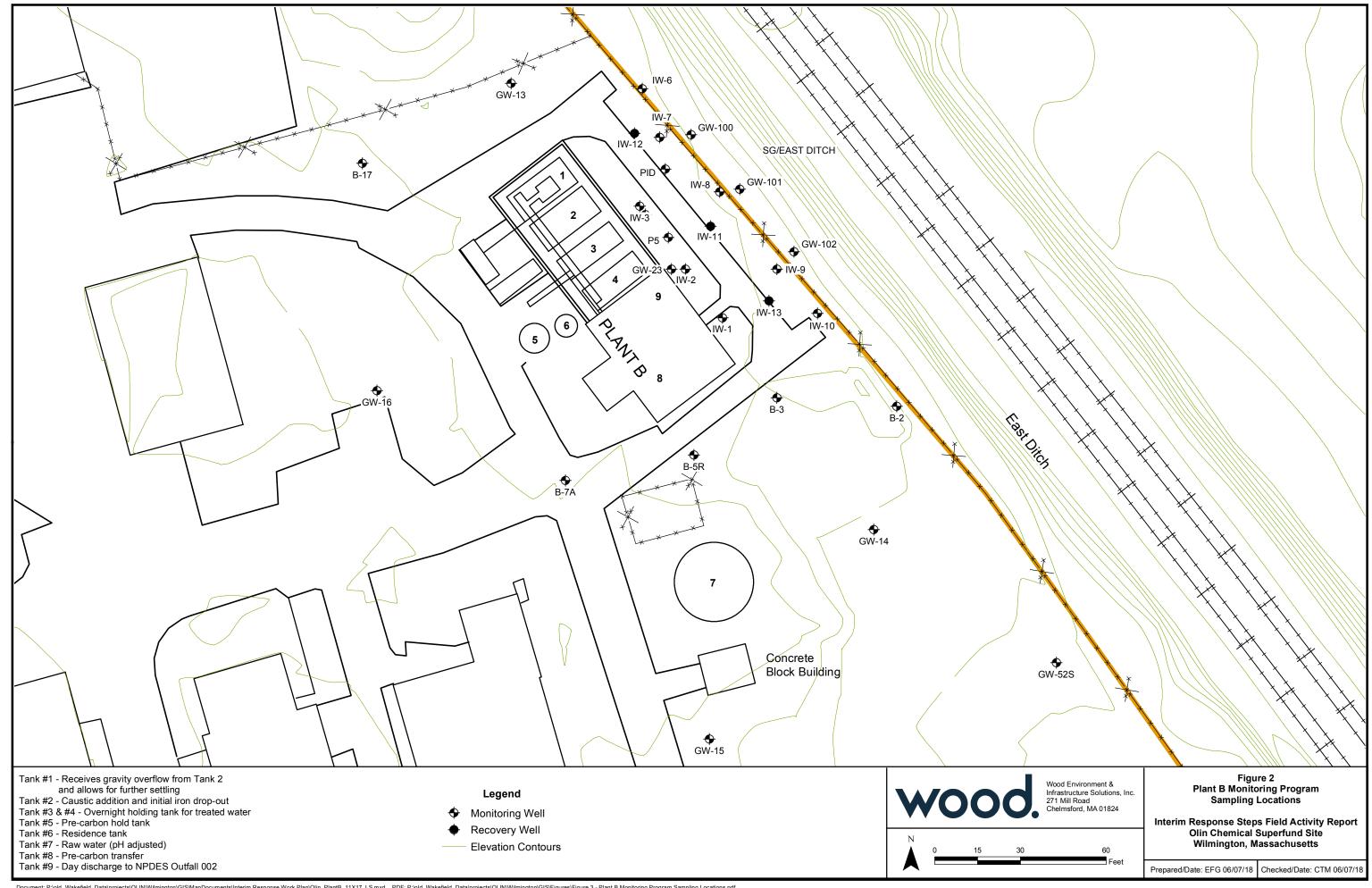
Checked by: SAM 5/10/2019

Notes: $\mu g/L \text{ - micrograms per liter}$ mg/L - milligrams per liter SU - standard units

wood.

Figures





wood.

Appendix A

Field Data Records and Field Instrument Calibration Records

DD O IECT V A	Œ					CALIBRA	TION RECOR	D	DATE: 4/2/2010
PROJECT NAM			Olin Chemica		nd Site		TASK NO:		DATE: 4/2/2019
PROJECT NUM PROJECT LOC				07190016 ilmington,	MA		WOOD CREW: SAMPLER NAME	7.	SAM/CTM Sam Mizusawa
WEATHER CC		M):			temps in ~ 20's		SAMPLER SIGNA		Field Form w/ Signature on File
	WEATHER CONDITIONS (PM): Sunny, temps in ~ 50's			CHECKED BY:	CTM	DATE: 4/9/2019			
MULTI-PARA			TV METER	j,			1		
METER TYPE	YSI	ER QUALI	II WEIEK	AM CAL	IBRATION		PM C	CALIBRATIO	N CHECK
MODEL NO.	556 MPS	_	Start Time:	7:00	End Time:	7:17			d Time: 14:45
UNIT ID NO.	M015-11								
		Units	Standard Value	Va	alue	eptance Criteria (AM)	Standard Value	Meter Value	*Acceptance Criteria (PM)
	pH (4)	SU	4.0			.1 pH Units			
	pH (7)	SU	7.0			.1 pH Units	7.0	7.17	+/- 0.3 pH Units
	pH (10)	SU	10.0			.1 pH Units	240	244.6	. / 10 - 17
C	Redox	+/- mV	240 1413			0 mV % of standard	240 1413	244.6 1485	+/- 10 mV
_	Conductivity O (saturated)	μS/cm %	100			% of standard % of standard	1415	109.7	+/- 5% of standard %
	O (saturated) m						9.18	10.02	+/- 0.5 mg/L of sat. value
L						.2 mg/L			
	DO (<0.1)	mg/L °C	< 0.1	_	< 0.5 14	5 mg/L	DO (<0.1)	21.49	< 0.5 mg/L °C
	Temperature Baro. Press.	mmHg			0.8			767.1	C mmHg
THE PARTY I		mining					G: 1 1		<u>. </u>
TURBIDITY M METER TYPE MODEL NO.	Hach 2100Q	_		Units	Standard Value	Meter Value	Standard Value	Meter Value	*Acceptance Criteria (PM)
UNIT ID NO.	M024-36		Standard	NTU	10	9.86	10	10.2	+/- 0.3 NTU of stan.
			Standard	NTU	20	20.0	20	22.0	+/- 5% of standard
			Standard	NTU	100	98.9	100	104	+/- 5% of standard
			Standard	NTU	800	781	800	805	+/- 5% of standard
PHOTOIONIZ METER TYPE MODEL NO.	CATION DETE		Background	ppmv	<0.1		<0.1		within 5 ppmv of BG
UNIT ID NO.		_	Span Gas	ppmv	100		100		+/- 10% of standard
O ₂ -LEL 4 GAS	METER	·						-	
METER TYPE			Methane	%	50		50		+/- 10% of standard
MODEL NO.			O_2	%	20.9		20.9		+/- 10% of standard
UNIT ID NO.		_	H_2S	ppmv	25		25		+/- 10% of standard
			CO	ppmv	50		50		+/- 10% of standard
OTHER MET	ER								
METER TYPE									See Notes Below
MODEL NO.									for Additional
UNIT ID NO.							<u> </u>		- Information
X Equipm	nent calibrated with	in the Acceptar	nce Criteria specified	l for each of	the parameters liste	d above.			
		d within the Acc	ceptance Criteria spe	ecified for ea	ch of the parameter	s listed above**.			
MATERIALS	RECORD					** ()	Cal. Standard Lot 1	<u>Number</u>	Exp. Date
Deionized Water	Courses		Portland - FC	20		pH (4) pH (7)	8GC347 8GC117		3/20
Lot#/Date			1 ordana - 1 C	.5		pH (10)			
Trip Blank Sour		L	ab			ORP	2340		12/22
Sample Preserva		L	ab			Conductivity	8GK308	-	11/19
Disposable Filter			0.45µm			10 Turb. Stan.	A8232		11/19
Calibration Fluid						20 Turb. Stan.	A8239		12/19
	on Fluid (<0.1 n	ng/L)				100 Turb. Stan.	A8236		11/19
- Other						800 Turb. Stan.	A8236		11/19
- Other - Other						PID Span Gas O2-LEL Span Gas			
- Oulci						DO DO	9GA674		1/20
NOTES:						-			



^{* =} Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-Field Calibration) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.

^{** =} If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.

^{1 =} DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-Field Calibration), dated 1/19/2010.

		BIB	LD INSTR	RUMEN	TATION	CALIBRA	TION RECOR	D	
PROJECT NAM	PROJECT NAME: Olin Chemical Superfund Site						TASK NO:		DATE: 4/3/2019
PROJECT NUM	IBER:		61	07190016			WOOD CREW:		CHL
PROJECT LOC	ATION:		W	ilmington, N	MA		SAMPLER NAME	:	Charles Lyman
WEATHER CO	NDITIONS (A	M):	Rain, breezey, cloudy, temps in mid ~ 30's			SAMPLER SIGNA	TURE:	Field Form w/ Signature on File	
WEATHER CO	NDITIONS (PA	<i>I</i> ():	Clo	oudy-sunny,	temps in ~ 60'	S	CHECKED BY:	CTM	DATE: 4/9/2019
MULTI-PARA	METER WAT	ER QUALI	TY METER						
METER TYPE	YSI			AM CALI	IBRATION		PM C	ALIBRATIO	N CHECK
MODEL NO.	556 MPS		Start Time:	7:50	End Time:	8:10	Start Time:	15:50 En	d Time: 16:00
UNIT ID NO.	M015-14	<u></u>							
		Units	Standard Value	Me Val		ceptance Criteria (AM)	Standard Value	Meter Value	*Acceptance Criteria (PM)
	pH (4)	SU	4.0	4.0		0.1 pH Units			
	pH (7)	SU	7.0	7.0		0.1 pH Units	7.0	7.01	+/- 0.3 pH Units
	pH (10)	SU	10.0			0.1 pH Units			
	Redox	+/- mV	240	240		10 mV	240	245.7	+/- 10 mV
_	Conductivity	µS/cm	1413	14		3% of standard	1413	1415	+/- 5% of standard
	O (saturated)	%	100	99		2% of standard		99.7	-
D	O (saturated) m	g/L ¹ (see Chart	7.81	7.8	32 +/- ().2 mg/L	9.30	9.18	+/- 0.5 mg/L of sat. value
	DO (<0.1)	mg/L	<0.1	0.2	< 0	5 mg/L	DO (<0.1)	0.18	< 0.5 mg/L
	Temperature	°C		27.	77			18.48	°C
	Baro. Press.	mmHg		757	7.0			752.4	mmHg
TURBIDITY N	METER			TT24	Standard	Meter	Standard	Meter	*Acceptance Criteria
METER TYPE	Hach	<u></u>		Units	Value	Value	Value	Value	(PM)
MODEL NO.	2100Q								
UNIT ID NO.	M024-31	_	Standard	NTU	10	9.78	10	10.1	+/- 0.3 NTU of stan.
			Standard	NTU	20	21.0	20	20.4	+/- 5% of standard
			Standard	NTU	100	101	100	101	+/- 5% of standard
			Standard	NTU	800	809	800	811	+/- 5% of standard
PHOTOIONIZ METER TYPE MODEL NO.	ATION DETE		Background	ppmv	<0.1		<0.1		within 5 ppmv of BG
UNIT ID NO.		_	Span Gas	ppmv	100		100		+/- 10% of standard
O ₂ -LEL 4 GAS	METER	_	Брин Сиз	PP····	100		100		17 10% of standard
METER TYPE	WILLIER		Methane	%	50		50		+/- 10% of standard
MODEL NO.		_	O_2	%	20.9		20.9		+/- 10% of standard
UNIT ID NO.		_	H ₂ S		25		25		+/- 10% of standard
CNII ID NO.		_	CO	ppmv ppmv	50		50		+/- 10% of standard
OTHER METI	7D			рршч			30		- +7- 10 % Of Standard
METER TYPE	2K								
MODEL NO.									See Notes Below
UNIT ID NO.									for Additional
CNII ID NO.						• ——			- Information
X Equipm	ent calibrated withi	n the Acceptan	ca Critaria enacifia	d for each of th	ha naramatare liete	ad above			
= ' '	ent (not) calibrated	•	•		•				
MATERIALS 1		within the Acc	epiance Criteria spi	ecified for each	ii oi uie parametei	is listed above.	Cal. Standard Lot N	umbor	Exp. Date
MATERIALS	KECOKD					pH (4)	8GC347	uniber	3/20
Deionized Water	Source:		Portland - FO	OS		pH (7)	8GC117		3/20
Lot#/Date						pH (10)			
Trip Blank Sour	e:	La	ıb			ORP	2340		12/22
Sample Preserva		La	ıb			Conductivity	8GK308		11/19
Disposable Filter	Туре:		0.45µm	-		10 Turb. Stan.	A8232		11/19
Calibration Fluid						20 Turb. Stan.	A8239		12/19
	on Fluid (<0.1 m	ng/L)				100 Turb. Stan.	A8236		11/19
- Other						800 Turb. Stan.	A8236		11/19
- Other						PID Span Gas			
- Other						O ₂ -LEL Span Gas	 9GA674		1/20
NOTES:						DO_	9UA0/4		1/20
MOTES:									



^{* =} Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-Field Calibration) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.

^{** =} If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.

^{1 =} DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-Field Calibration), dated 1/19/2010.

DD O IECT MAN		18118				CALIBRAT	TION RECOR	D	DATE 4/2/2010
PROJECT NAM PROJECT NUM		Olin Chemical Superfund Site 6107190016					TASK NO: WOOD CREW:		DATE: 4/3/2019
PROJECT NON PROJECT LOC		Wilmington, MA				SAMPLER NAME		SAM Sam Mizusawa	
						SAMPLER SIGNA		Field Form w/ Signature on File	
WEATHER CONDITIONS (AM): Rain, breezey, cloudy, temps in mid ~ 30's WEATHER CONDITIONS (PM): Cloudy-sunny, temps in ~ 60's				CHECKED BY:	CTM	DATE: 4/9/2019			
MULTI-PARA		<u> </u>			,	<u> </u>			
METER TYPE	YSI	ER QUAL	III METEK	AM CAL	IBRATION		PM C	ALIBRATIO	N CHECK
MODEL NO.	556 MPS	_	Start Time:	7:14	End Time:	7:33			d Time: 15:51
UNIT ID NO.	M015-11	_							
		Units	Standard Value	Va	alue	eptance Criteria (AM)	Standard Value	Meter Value	*Acceptance Criteria (PM)
	pH (4)	SU	4.0			.1 pH Units			
	pH (7)	SU	7.0			.1 pH Units	7.0	7.04	+/- 0.3 pH Units
	pH (10)	SU	10.0			.1 pH Units	240	227.0	. / 10 - 17
C	Redox	+/- mV	240			0 mV	240 1413	237.9 1482	+/- 10 mV
_	Conductivity O (saturated)	μS/cm %	1413 100			% of standard % of standard	1413	97.6	+/- 5% of standard %
	O (saturated) mg			-			8.28	8.24	+/- 0.5 mg/L of sat. value
D						.2 mg/L			
	DO (<0.1)	mg/L °C	< 0.1		24 < 0.5 15	5 mg/L	DO (<0.1)	0.25 23.62	< 0.5 mg/L °C
	Temperature Baro. Press.	mmHg			9.8			752.1	. C mmHg
THE PARTY I		mining					G: 1 1		<u> </u>
TURBIDITY N METER TYPE MODEL NO.	Hach 21000	_		Units	Standard Value	Meter Value	Standard Value	Meter Value	*Acceptance Criteria (PM)
UNIT ID NO.	M024-36	_	Standard	NTU	10	9.80	10	10.3	+/- 0.3 NTU of stan.
		_	Standard	NTU	20	19.5	20	20.2	+/- 5% of standard
			Standard	NTU	100	98.6	100	102	+/- 5% of standard
			Standard	NTU	800	789	800	807	+/- 5% of standard
PHOTOIONIZ METER TYPE MODEL NO.	ATION DETEC		Background	ppmv	<0.1		<0.1		within 5 ppmv of BG
UNIT ID NO.		_	Span Gas	ppmv	100		100		+/- 10% of standard
O ₂ -LEL 4 GAS	METER	_		- 1 1					
METER TYPE			Methane	%	50		50		+/- 10% of standard
MODEL NO.		_	O_2	%	20.9		20.9	·	+/- 10% of standard
UNIT ID NO.		_	H_2S	ppmv	25		25		+/- 10% of standard
		_	CO	ppmv	50		50		+/- 10% of standard
OTHER METI	ER								
METER TYPE									G N . D 1
MODEL NO.									See Notes Below for Additional
UNIT ID NO.									- Information
									·
X Equipm	ent calibrated within	n the Acceptai	nce Criteria specified	d for each of t	the parameters liste	d above.			
Equipm	ent (not) calibrated	within the Ac	ceptance Criteria spe	ecified for eac	ch of the parameter	s listed above**.			
MATERIALS 1	RECORD						Cal. Standard Lot N	<u>Number</u>	Exp. Date
D. I. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	G		D 4 1 DC	NG.		pH (4)	8GC347		3/20
Deionized Water Lot#/Date			Portland - FC)8		pH (7)	8GC117		3/20
Trip Blank Sour		T	ab			pH (10) ORP	2340		12/22
Sample Preserva			ab			Conductivity	8GK308		11/19
Disposable Filter			0.45µm			10 Turb. Stan.	A8232		11/19
Calibration Fluid		ource:				20 Turb. Stan.	A8239		12/19
- DO Calibratio	on Fluid (<0.1 m	ng/L)				100 Turb. Stan.	A8236		11/19
- Other						800 Turb. Stan.	A8236		11/19
- Other						PID Span Gas			
- Other						O ₂ -LEL Span Gas DO	9GA674		1/20
NOTES:							70/10/14		1,20
TIO I LIDI									_



^{* =} Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-Field Calibration) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.

^{** =} If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.

^{1 =} DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-Field Calibration), dated 1/19/2010.

DD O WOOT ALLA						CALIBRA'	TION RECOR	D	D. A. T. C.
PROJECT NAM			Olin Chemica		d Site		TASK NO:		DATE: 4/3/2019
PROJECT NUM				07190016			WOOD CREW:		JJL
PROJECT LOC		3.0		ilmington, N		1 201	SAMPLER NAME		Jolene Lozewski
WEATHER CO					y, temps in mic		SAMPLER SIGNA	-	Field Form w/ Signature on File
WEATHER CO				budy-sunny,	temps in ~ 60'	S	CHECKED BY:	CTM	DATE: 4/9/2019
MULTI-PARA		ER QUALI	TY METER	AMCALI	IDD ATION		DM C	(AT IDD ATIO)	N CHECK
METER TYPE	YSI 556 MDC	_	Gr. 4 mg		IBRATION E. LT:	7.00		ALIBRATIO	
MODEL NO. UNIT ID NO.	556 MPS M015-12	_	Start Time:	6:30	End Time:	7:00	Start Time:	15:55 End	l Time: 16:15
UNIT ID NO.	WI013-12	— Units	Standard Value	Me Val		ceptance Criteria (AM)	Standard Value	Meter Value	*Acceptance Criteria (PM)
	pH (4)	SU	4.0	4.0	00 +/- (0.1 pH Units			
	pH (7)	SU	7.0	7.0).1 pH Units	7.0	7.15	+/- 0.3 pH Units
	pH (10)	SU	10.0		+/- (0.1 pH Units			-
	Redox	+/- mV	240	240	0.0 +/- 1	10 mV	240	236.4	+/- 10 mV
Sp.	Conductivity	μS/cm	1413	14	13 +/- 3	3% of standard	1413	1445	+/- 5% of standard
	O (saturated)	%	100	99	9.6 +/- 2	2% of standard		106.3	%
D	O (saturated) m	ng/L ¹ (see Chart	7.63	7.6	66 +/- ().2 mg/L	8.59	8.88	+/- 0.5 mg/L of sat. value
	DO (<0.1)	mg/L	<0.1	0.3	30 < 0.	5 mg/L	DO (<0.1)	0.20	< 0.5 mg/L
	Temperature	°C		29.		C	, , , ,	21.75	°C
	Baro. Press.	mmHg		756	6.9			752.0	mmHg
TURBIDITY N	METER				Standard	Meter	Standard	Meter	*Acceptance Criteria
METER TYPE	Hach			Units	Value	Value	Value	Value	(PM)
MODEL NO.	2100Q								
UNIT ID NO.	M024-27	_	Standard	NTU	10	10.4	10	10.4	+/- 0.3 NTU of stan.
			Standard	NTU	20	19.9	20	19.6	+/- 5% of standard
			Standard	NTU	100	96.7	100	97.3	+/- 5% of standard
			Standard	NTU	800	778	800	772	+/- 5% of standard
PHOTOIONIZ METER TYPE	ATION DETE		Background	ppmv	<0.1		<0.1		within 5 ppmv of BG
MODEL NO. UNIT ID NO.		_	Span Gas	ppmv	100		100		+/- 10% of standard
O ₂ -LEL 4 GAS	METER	_	Брин Сиз	rr					17 10% of standard
METER TYPE	WIE I EK		Methane	%	50		50		+/- 10% of standard
MODEL NO.	-	_	O ₂	%	20.9		20.9		+/- 10% of standard
UNIT ID NO.	-	_	H_2S	ppmv	25		25		+/- 10% of standard
01111111111111	_	<u> </u>	CO	ppmv	50		50		+/- 10% of standard
OTHER METI	ER			11					
METER TYPE									
MODEL NO.						·			See Notes Below
UNIT ID NO.									for Additional
	-					• ——		-	Information
X Equipm	ent calibrated with	in the Acceptan	ce Criteria specifie	d for each of the	he parameters list	ed above.			
		•	ceptance Criteria spe		•				
MATERIALS							Cal. Standard Lot N	Number	Exp. Date
						pH (4)	8GC347		3/20
Deionized Water	Source:		Portland - FC	OS		pH (7)	8GC117		3/20
Lot#/Date						pH (10)			
Trip Blank Sour		La				ORP	2340		12/22
Sample Preserva		La				Conductivity_	8GK308		11/19
Disposable Filter			0.45µm			10 Turb. Stan.	A8232		11/19
Calibration Fluid						20 Turb. Stan.	A8239		12/19
	on Fluid (<0.1 n	ng/L)				100 Turb. Stan 800 Turb. Stan.	A8236 A8236		11/19
- Other - Other						PID Span Gas	A8230		
- Other						O ₂ -LEL Span Gas			
			•			DO DO	9GA674		1/20
NOTES:									



^{* =} Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-Field Calibration) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.

^{** =} If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.

^{1 =} DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-Field Calibration), dated 1/19/2010.

			LD INSTR	RUMEN	TATION	CALIBRA'	TION RECOR	0	
PROJECT NAM	⁄IЕ:		Olin Chemic	al Superfunc	l Site		TASK NO:		DATE: 4/4/2019
PROJECT NUM	/IBER:		61	07190016			WOOD CREW:		SAM
PROJECT LOC	CATION:		W	ilmington, N	ЛA		SAMPLER NAME:		Sam Mizusawa
WEATHER CO	NDITIONS (AN	M):	S	unny, temps	in mid ~ 30's		SAMPLER SIGNA	TURE:	Field Form w/ Signature on File
WEATHER CO	NDITIONS (PA	1):	Sunn	y, windy, ter	mps in high ~ 4	-0's	CHECKED BY:	CTM	DATE: 4/9/2019
MULTI-PARA	METER WAT	ER QUALI	TY METER						
METER TYPE	YSI			AM CALI	BRATION		PM C	ALIBRATIO	N CHECK
MODEL NO.	556 MPS	_	Start Time:	7:12	End Time:	7:27	Start Time:	5:40 En	d Time: 15:50
UNIT ID NO.	M015-11	_							
		Units	Standard Value	Me Val		ceptance Criteria (AM)	Standard Value	Meter Value	*Acceptance Criteria (PM)
	pH (4)	SU	4.0	4.0		.1 pH Units			
	pH (7)	SU	7.0	7.0		.1 pH Units	7.0	7.07	+/- 0.3 pH Units
	pH (10)	SU	10.0			.1 pH Units			
	Redox	+/- mV	240	240		0 mV	240	236.4	+/- 10 mV
_	Conductivity	µS/cm	1413	14		% of standard	1413	1462	+/- 5% of standard
	O (saturated)	%	100	100	<u>).7 </u>	% of standard		103.8	- %
D	O (saturated) m	g/L ¹ (see Chart	8.30	8.3	+/- 0	.2 mg/L	8.30	8.54	+/- 0.5 mg/L of sat. value
	DO (<0.1)	mg/L	<0.1	0.2	< 0.5	5 mg/L	DO (<0.1)	0.24	< 0.5 mg/L
	Temperature	°C		25.	05			25.16	°C
	Baro. Press.	mmHg		766	5.1			762.9	mmHg
TURBIDITY M	METER			TT24	Standard	Meter	Standard	Meter	*Acceptance Criteria
METER TYPE	Hach			Units	Value	Value	Value	Value	(PM)
MODEL NO.	2100Q	_							
UNIT ID NO.	M024-36	_	Standard	NTU	10	9.76	10	9.84	+/- 0.3 NTU of stan.
			Standard	NTU	20	20.0	20	20.3	+/- 5% of standard
			Standard	NTU	100	99.9	100	102	+/- 5% of standard
			Standard	NTU	800	782	800	784	+/- 5% of standard
PHOTOIONIZ METER TYPE MODEL NO.	ATION DETE		Background	ppmv	<0.1		<0.1		within 5 ppmv of BG
UNIT ID NO.		_	Span Gas	ppmv	100		100		+/- 10% of standard
O ₂ -LEL 4 GAS	METER	<u> </u>	Брин Сиз	11					
METER TYPE			Methane	%	50		50		+/- 10% of standard
MODEL NO.		_	O ₂	%	20.9		20.9		+/- 10% of standard
UNIT ID NO.		_	H ₂ S	ppmv	25		25		+/- 10% of standard
01/11/12/1/01	_	_	CO	ppmv	50		50		+/- 10% of standard
OTHER METE	ER			11					
METER TYPE									
MODEL NO.									See Notes Below
UNIT ID NO.	_				_				for Additional
01/11/12/1/01	·				-				- Information
X Equipm	ent calibrated withi	n the Acceptan	ce Criteria specifie	d for each of th	ne parameters liste	ed above.			
= ::	nent (not) calibrated	•	•		•				
MATERIALS I							Cal. Standard Lot N	umber	Exp. Date
WHITEHILE	RECORD					pH (4)	8GC347		3/20
Deionized Water	Source:		Portland - FO	OS		pH (7)	8GC117		3/20
Lot#/Date	Produced:					pH (10)			
Trip Blank Sourc	ce:	La	ıb			ORP	2340		12/22
Sample Preservat		La				Conductivity	8GK308		11/19
Disposable Filter			0.45µm			10 Turb. Stan.	A8232		11/19
Calibration Fluid						20 Turb. Stan.	A8239		12/19
	on Fluid (<0.1 m	ng/L)				100 Turb. Stan.	A8236		11/19
- Other						800 Turb. Stan.	A8236		11/19
- Other						PID Span Gas			
- Other						O ₂ -LEL Span Gas DO	9GA674		1/20
NOTES:							, 5/10/1		
- 1 U I II U 1									



^{* =} Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-Field Calibration) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.

^{** =} If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.

^{1 =} DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-Field Calibration), dated 1/19/2010.

			UCTURE SOLU W FLOW G	TIONS, INC. ROUNDWA	TER SAI	MPLING					
PROJECT	OLIN CHEMIC	AL SUPERFUND	SITE, WILMINGTO	N, MA	WE	LL ID	GW-25			ROUND NO). 1
SAMPLE ID		OC-GW-2	5		SITE 1	ТҮРЕ	Superfund			DATE 4/	4/2019
TIME	START	11:05 END	11:51		JOB NUMB	BER	6107190016			BOTTLE TIME	11:45
QC SAN	EVEL / PUMP S MPLE CTED ID	SETTINGS N/A	X TOF	REMENT POINT OF WELL RISER OF PROTECTIVE HER	CASING	PROTECTIVE CASING STIC (FROM GROU	KUP	FT.	PROTEC CASING DIFFERE	/ WELL	FT.
INITIAL DEI		4.90 F	T. WELL DE			PID	N/A	DDM	WELL	-0 15	
FINAL DE		5.10 F	T. SCREEN			AMBIENT AIR PID WELL		PPM	WELL	YES	NO N/A
DRAWDO VOLU (final - i	IME	0.02 G/ ch} or x 0.65 {4-inc		N/A OF DRAWDOWN V OTAL VOLUME PUI		MOUTH PRESSURE TO PUMP	N/A	PPM	INTEGRI	TY: CAP X CASING X LOCKED X COLLAR X	
TOTAL V	/OL.	1.24 GA		0.02		REFILL TIMER SETTING	N/A	SEC.	DISCHAF TIMER SETTING	RGE N/A	SEC.
PURGE D											
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (µS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMEN	TS
11:08	5.10	136	Connect YSI						~ 11 ft.		
11:15	5.10	136	8.03	1210	6.85	4.35	3.60	-0.2			
11:30 11:35	5.10 5.10	136 136	8.47 8.65	1204 1196	7.09 7.11	2.04 1.94	2.72	-66.9 -76.4			
11:40	5.10	136	8.64	1193	7.10	1.88	2.42	-73.0			
11:45	Collect	Sample									
TYPE C	NT DOCUMEN OF PUMP ED BLADDER MCO BLADDER EOPUMP		TYPE OF TUBING TEFLON OR X HIGH DENSIT LDPE (Dedica	TEFLON LINED TY POLYETHYLEN	E	POL'	PUMP MATERIAL YVINYL CHLORIDE NLESS STEEL CON (Dedicated)			TYPE OF BLADDER TEFLON OTHER	R MATERIAL
ANALYTIC To Be Collected	CAL PARAMET	ERS	MET NUM			RESERVATION ETHOD	VOLUME REQUIRED	!	SAMPLE COLLECTED		
SVC VPH Diss pH X Amm X Chl X Sul X Spe X Diss	solved Fe monia-Nitrogen oride fate ecific Conductivity solved Al, Cr	,	8260 8270 MA \ DIS. SM 4 10-11 300.1 300.1	B B C C PH 6610B 5500 H+B 07-06-1	HC 4 [HC HN 4 [H2 4 [4 [4 [CL / 4 DEG. C DEG. C CL / 4 DEG. C NO3 / 4 DEG. C DEG. C DEG. C DEG. C DEG. C DEG. C	3 X 40 mL 2 X 1 L AG 3 X 40 mL 1 X 500 mL 1 X 250 mL 1 X 125 mL 1 X 125 mL 1 X 125 mL 1 X 125 mL		VOC SVO VPH Dis. pH X Amm X Chlo X Sulfa	Cs Fe nonia-Nitrogen ride ate conductivity	
PURGE WA		_	NUMBER OF GAL	LONS		LOCATION	SKETCH				
NOTES SIGNATURE	RIZED YES Chloride and Su	-	GENERATED ected in one 500mL	~ 1.2 ga	<u>al.</u>	Sampled I Prepared Checked I	by: SAM			Wo	od.

			UCTURE SOLU W FLOW G	ITIONS, INC.	TER SA	MPLING					
PROJECT	OLIN CHEMICA	AL SUPERFUND S	SITE, WILMINGTO	N, MA	WEL	.L ID	GW-78S]	ROUND N	0. 1
SAMPLE ID		OC-GW-78	S		SITE T	YPE	Superfund]	DATE 4	1/3/2019
TIME	START	12:51 ENI	14:41		JOB NUMBI	ER	6107190016			BOTTLE TIME	14:35
QC SAN	EVEL / PUMP S	SETTINGS N/A	X TOF	REMENT POINT POF WELL RISER OF PROTECTIVE	CASING	PROTECTIVE CASING STIC (FROM GROU	KUP	FT.	PROTEC CASING DIFFERE	/ WELL	FT.
INITIAL DE TO WA		4.05 F	T. WELL DE	EPTH 10.54		PID	N/A	DDM	WELL DIAMETE	ER 2	
FINAL DE TO WA		4.24 F	(TOR) T. SCREEN LENGTH	<u> </u>	FT.	AMBIENT AIR PID WELL MOUTH	N/A	PPM	WELL INTEGRI	YES	NO N/A
DRAWDO VOLU (final - i	JME	0.03 G/h} or x 0.65 {4-inc	AL. RATIO	OF DRAWDOWN \	/OLUME	PRESSURE TO PUMP	N/A	PSI		TY: CAP X CASING X LOCKED X COLLAR X	
TOTAL \ PUR((purge i	GED	4.22 G/ minute) x time du	AL. uration (minutes) x	<0.01 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHAF TIMER SETTING	N/A	SEC.
PURGE D	ATA										
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (µS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMME	NTS
12:58	4.24	164	Connect YSI						~ 8 ft.		
13:05	4.24	164	8.29	1281	6.84	2.06	92.4	97.1			
13:25	4.24 4.24	164	8.02 8.59	1275 1274	6.76	3.24 2.81	55.1 25.7	86.6 87.8			
13:45 14:05	4.24	164 164	9.11	1274	6.75 6.74	1.97	11.4	95.9			
14:10	4.24	164	9.36	1274	6.74	1.68	9.90	97.6			
14:20	4.24	164	9.44	1273	6.74	1.42	6.11	100.6			
14:25	4.24	164	9.27	1275	6.74	1.35	5.98	101.2			
14:30	4.24	164	9.36	1272	6.74	1.24	5.63	101.5			
14:35	Collect	Sample									
TYPE C	NT DOCUMEN' DE PUMP ED BLADDER MCO BLADDER EOPUMP		TYPE OF TUBING TEFLON OF X HIGH DENS LDPE (Dedic	TEFLON LINED	NE	POL STA	PUMP MATERIAL YVINYL CHLORIDE INLESS STEEL CON (Dedicated)			TYPE OF BLADDE TEFLON OTHER	R MATERIAL
ANALYTIC To Be Collected	CAL PARAMET	ERS	MET <u>NUM</u>	HOD IBER		ESERVATION THOD	VOLUME REQUIRED	ļ.	SAMPLE COLLECTED		
SVC VPI Diss pH X Am X Chl X Sul X Spe	solved Fe monia-Nitrogen oride	3EHP	8260 8270 MA \ DIS. SM 4 10-1: 300. 300. SM 2	B C /PH 6010B 1500 H+B 07-06-1	HCI 4 D HCI HNI 4 D H2S 4 D 4 D 4 D	L / 4 DEG. C IEG. C L / 4 DEG. C O3 / 4 DEG. C IEG. C IEG. C IEG. C IEG. C IEG. C O3 / 4 DEG. C	1 X 500 mL 1 X 500 mL 1 X 500 mL		VOC SVO VPH Dis. pH X Amm X Chlo	Cs Fe nonia-Nitrogen ride ate cific Conductivity	
PURGE WA		_	NUMBER OF GA	LLONS		LOCATION	SKETCH				
NOTES SIGNATURE	Chloride and Su	-	GENERATED ected in one 500m	~ 4.2 g	<u>al.</u>	Sampled Prepared Checked	by: SAM			Wo	od.

			W FLOW G	JTIONS, INC. IROUNDWA	TER SA	MPLING					
PROJECT	OLIN CHEMICA	AL SUPERFUND	SITE, WILMINGTO	N, MA	WEL	L ID	GW-79S			ROUND) NO. 1
SAMPLE ID		OC-GW-79	S		SITE T	YPE	Superfund			DATE	4/4/2019
TIME	START	7:41 EN	D 8:41		JOB NUMBI	ER	6107190016]	BOTTLE TIME	8:35
QC SAN	EVEL / PUMP : MPLE CTED ID	SETTINGS N/A	X TOF	REMENT POINT P OF WELL RISER P OF PROTECTIVE HER	CASING	PROTECTIVE CASING STIC (FROM GRO	CKUP	FT.	PROTEC CASING DIFFERE	/ WELL	A FT.
INITIAL DE		3.18 F	T. WELL DE	EPTH 11.38	FT.	PID AMBIENT AIF	R N/A	PPM	WELL DIAMETE	ER 2	IN.
FINAL DE		3.22 F	T. SCREEN LENGTH	1	FT.	PID WELL MOUTH	N/A	PPM	WELL INTEGRI	YES	
DRAWDC VOLU (final - i	IME -	<0.01 G	AL. RATIO	OF DRAWDOWN V	OLUME	PRESSURE TO PUMP	N/A	PSI]	TY: CAP X CASING X LOCKED X COLLAR X	
TOTAL V PURO (purge r	GED		AL. uration (minutes) x	<0.01 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHAF TIMER SETTING	N/A	SEC.
PURGE D											
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (µS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMM	MENTS
7:45	3.22	192	Connect YSI						~ 10 ft.		
7:50	3.22	192	5.80	2157	6.40	8.84	16.4	92.6			
8:00	3.22	192	5.15	2142	6.40	5.92	11.9	55.9			
8:10	3.22	192 192	5.00	2139	6.39	7.40 6.79	10.8	43.2			
8:20 8:25	3.22 3.22	192	5.03 5.03	2135 2136	6.38 6.40	6.20	8.41 7.84	41.4			
8:30	3.22	192	5.05	2138	6.38	5.67	7.26	44.0			
8:35		Sample									
EQUIPME	NT DOCUMEN	TATION									
QE SIN	DE PUMP ED BLADDER MCO BLADDER EOPUMP			- TEFLON LINED TY POLYETHYLEN	IE	POL	F PUMP MATERIAL LYVINYL CHLORIDE NINLESS STEEL CON (Dedicated)	į		TYPE OF BLADI TEFLON OTHER	<u>)ER MATERIAL</u>
ANALYTIC To Be Collected	CAL PARAMET	ERS		HOD IBER		ESERVATION THOD	VOLUME REQUIRED	1	SAMPLE COLLECTED		
SVC VPH Diss pH X Ami X Chl X Sul: X Spe	solved Fe monia-Nitrogen oride	ВЕНР	SM ² 10-1 300. 300. SM ²	0 C /PH 6010B 1500 H+B 07-06-1	4 D HC HN 4 D H23 4 D 4 D 4 D	L / 4 DEG. C IEG. C L / 4 DEG. C O3 / 4 DEG. C IEG. C SO4 / 4 DEG. (IEG. C IEG. C IEG. C O3 / 4 DEG. C	1 X 500 mL C 1 X 250 mL 1 X 500 mL 1 X 500 mL 1 X 500 mL		X Chlo	Cs Fe nonia-Nitrogen ride ate cific Conductivity	
PURGE OF PURGE WA CONTAINER			NUMBER OF GA GENERATED	LLONS ~ 2.5 ga	al.	LOCATION	SKETCH				
NOTES SIGNATURE		ılfate analysis coll	lected in one 500m	L bottle		Prepared	by: SAM by: SAM by: CTM			W	ood.

		& INFRASTRU CORD - LOV		•	ATER SA	MPLING					
PROJECT	OLIN CHEMICA	AL SUPERFUND S	SITE, WILMINGTO	N, MA	WEI	LL ID	GW-202S]	ROUND NO.	1
SAMPLE ID		OC-GW-202	S		SITE T	TYPE	Superfund]	DATE 4/3/	2019
TIME	START	7:10 END	8:05		JOB NUMB	SER	6107190016]	BOTTLE TIME 8	:00
QC SAM	EVEL / PUMP S MPLE CTED ID	SETTINGS N/A	X TOF	REMENT POINT P OF WELL RISE P OF PROTECTIV		PROTECTIVE CASING STIC (FROM GROU	KUP	FT.	PROTEC CASING DIFFERI	/ WELL	FT.
INITIAL DE TO WA		6.00 F1				PID			WELL		
FINAL DE TO WA		6.05 F1	(TOR) T. SCREEN	13.29) FT.	AMBIENT AIR	N/A	PPM	DIAMETI WELL		IN. NO N/A
DRAWDO VOLU (final - i	IME <	<0.01 GA		8 OF DRAWDOWN		MOUTH PRESSURE TO PUMP	N/A	PPM] INTEGR	TY:	
TOTAL \	/OL.	1.92 GA	L.	<0.01 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHAI TIMER SETTING	RGE N/A	SEC.
PURGE D	ATA	•									
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (µS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS	3
7:18	Start Pump								~ 10 ft.		
7:30	6.02	200	7.55	959	6.01	2.13	16.3	76.0			
7:35 7:40	6.05 6.05	200	7.60 7.68	958 957	6.03	0.86	14.2 10.6	74.5 74.2			
7:45	6.05	200	7.88	956	6.08	0.66	4.95	71.7			
7:50	6.05	200	7.95	959	6.10	0.67	3.82	70.3			
7:55	6.05	200	7.99	962	6.13	0.70	3.91	68.2			
8:00	Collect	Sample									
						1					
TYPE C	NT DOCUMEN' DE PUMP ED BLADDER MCO BLADDER EOPUMP		TYPE OF TUBING TEFLON OF X HIGH DENS LDPE (Dedic	TEFLON LINED	ENE	POL STA	PUMP MATERIAL YVINYL CHLORIDE INLESS STEEL CON (Dedicated)	:		TYPE OF BLADDER N	1ATERIAL
	CAL PARAMET	ERS				<u> </u>	2011 (200100100)				
To Be Collected	d			<u>IBER</u>	<u>ME</u>	RESERVATION ETHOD	VOLUME REQUIRED	1	SAMPLE COLLECTED		
_	Cs: Trimethylpent DCs: NDPA and E		8260 8270			CL / 4 DEG. C DEG. C	3 X 40 mL 2 X 1 L AG		voc		
VPI			MA \			CL / 4 DEG. C	3 X 40 mL		VPH		
Dis:	solved Fe			6010B I500 H+B		NO3 / 4 DEG. C DEG. C	1 X 500 mL 1 X 500 mL		Dis.	Fe	
X Am	monia-Nitrogen		10-1 300.	07-06-1 n		SO4 / 4 DEG. (DEG. C	1 X 250 mL 1 X 500 mL		X Amn	nonia-Nitrogen	
X Sul			300.			DEG. C	1 X 500 mL		X Sulfa		
	ecific Conductivity solved Al, Cr			2510B 6010B		DEG. C NO3 / 4 DEG. C	1 X 500 mL 1 X 500 mL		X Spe	cific Conductivity	
LX Dis.	solved AI, OI		DIO.	00100	1110	1037 4 DEG. 0	1 X 300 IIIL		X DI3.	Ai, Oi	
PURGE O	BSERVATIONS	3				LOCATION	SKETCH				
PURGE WA CONTAINER			NUMBER OF GA GENERATED	LLONS ~ 1.9	gal.						
NOTES	Chloride and Su	lfate analysis colle	ected in one 500m	L bottle							
						Sampled Prepared				Woo	od.
SIGNATURE	: Field	d Form w/ Signa	ture on File			Checked	by: CTM				

			UCTURE SOLU W FLOW G	ITIONS, INC. ROUNDWA	TER SA	MPLING					
PROJECT	OLIN CHEMICA	L SUPERFUND S	SITE, WILMINGTO	N, MA	WEL	L ID	GW-202D			ROU	ND NO. 1
SAMPLE ID		OC-GW-202	D		SITE T	YPE	Superfund			DATE	4/3/2019
TIME	START	8:10 END	9:10		JOB NUMBE	ER	6107190016			BOTTLE TIME	9:00
QC SAN	EVEL / PUMP S	SETTINGS N/A	X TOF	EMENT POINT OF WELL RISER OF PROTECTIVE	CASING	PROTECTIVE CASING STIC (FROM GROU	KUP	FT.	PROTE CASINO DIFFEF	3 / WELL	J/A FT.
INITIAL DE		5.41 F				PID			WELL		
FINAL DE		5.45 F	(TOR) T. SCREEN	22.68	FT.	AMBIENT AIR	N/A	PPM	DIAME1 WELL		IN. SES NO N/A
DRAWDO VOLU (final - i	ME <	:0.01 GA h} or x 0.65 {4-inc		10 OF DRAWDOWN V DTAL VOLUME PU		MOUTH PRESSURE TO PUMP	N/A	PPM	INTEGF	RITY: CAP CASING LOCKED COLLAR	X X X
TOTAL V PURO (purge r	GED	2.24 GA minute) x time du	AL. Iration (minutes) x	<0.01 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHA TIMER SETTIN	N/A	A SEC.
PURGE DA	ATA										
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (µS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	CO	MMENTS
8:12	Start Pump								~ 20 ft.	very turbid	
8:15	5.43	200	8.55	2366	5.10	1.65	>1000	89.6			
8:20	5.45	200	8.48	2367	5.02	1.34	343	83.8			
8:25 8:30	5.45 5.45	200 200	8.47 8.51	2377 2409	5.00 5.01	1.43	117 60.9	79.6 77.2			
8:35	5.45	200	8.66	2409	5.02	1.12	63.8	75.3			
8:40	5.45	200	8.68	2435	5.02	1.13	66.9	73.9			
8:45	5.45	200	8.72	2442	5.02	0.99	72.1	72.4			
8:50	5.45	200	8.83	2439	5.03	0.95	71.3	71.0			
8:55	5.45	200	8.90	2439	5.04	0.92	75.4	69.8			
9:00	Collect	Sample									
TYPE C	NT DOCUMENT OF PUMP OF BLADDER MCO BLADDER OPUMP	[[[- TEFLON LINED TY POLYETHYLEN	NE	POL STA	PUMP MATERIAL YVINYL CHLORIDE INLESS STEEL CON (Dedicated)			TYPE OF BLA	ADDER MATERIAL
To Be Collected	CAL PARAMET	EHS	MET <u>NUM</u>			ESERVATION THOD	VOLUME REQUIRED		SAMPLE COLLECTED	<u>2</u>	
SVC VPH Diss pH X Am X Chl X Sul	solved Fe monia-Nitrogen oride	SM 4 10-1 300. 300. SM 2	C /PH 6010B .500 H+B 07-06-1	4 D HCI HN0 4 D H2S 4 D 4 D 4 D	L / 4 DEG. C EG. C L / 4 DEG. C O3 / 4 DEG. C EG. C EG. C EG. C EG. C EG. C	1 X 500 mL 1 X 500 mL 1 X 500 mL		VPI Dis pH X Am X Chl	OCs H . Fe monia-Nitrogen oride fate acific Conductivity		
PURGE O	BSERVATIONS	3				LOCATION	SKETCH				
PURGE WA CONTAINER NOTES	RIZED YES	NO	NUMBER OF GAI GENERATED ected in one 500m	~ 2.2 ga	al.						
SIGNATURE						Sampled Prepared Checked	by: SAM			W	ood.

			UCTURE SOLI W FLOW G	TIONS, INC.	ATER SAI	MPLING				
PROJECT	OLIN CHEMICA	AL SUPERFUND :	SITE, WILMINGTO	N, MA	WEL	L ID	PZ-16RRR			ROUND NO. 1
SAMPLE ID		OC-PZ-16RF	RR		SITE T	YPE	Superfund			DATE 4/4/2019
TIME	START	8:47 ENI	9:39		JOB NUMBE	ER	6107190016]	BOTTLE TIME 9:30
QC SAM	EVEL / PUMP S MPLE CTED ID	SETTINGS N/A	TOF	REMENT POINT P OF WELL RISEF P OF PROTECTIVI HER		PROTECTIVE CASING STIC (FROM GROL	KUP	FT.	PROTEC CASING DIFFERE	/ WELL
INITIAL DE TO WA		3.44 F	T. WELL DI			PID	NI/A	2214	WELL	-5 10 "
FINAL DE TO WA		3.79 F	(TOR) T. SCREEN		FT.	AMBIENT AIR PID WELL	N/A	PPM	DIAMETE WELL	YES NO N/
DRAWDO VOLU (final - i	JME	0.01 G/ ch} or x 0.65 {4-inc		OF DRAWDOWN OTAL VOLUME PI		MOUTH PRESSURE TO PUMP	N/A	PPM	INTEGRI	TY: CAP
TOTAL \ PUR(GED	1.09 G/	AL. uration (minutes) x	0.01 (0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHAF TIMER SETTING	RGE N/A SEC.
PURGE D	ATA									
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (µS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
8:49	3.79	110	Connect YSI						~ 6 ft.	
8:55	3.79	110	5.34	1881	6.66	3.83	18.8	32.2		
9:05	3.79	110	5.57	1976	6.63	2.33	10.7	21.9		
9:15 9:20	3.79 3.79	110 110	5.62 5.69	1941 1891	6.62	2.79 2.90	4.91 3.75	21.9		
9:25	3.79	110	5.72	1861	6.60	2.97	2.47	20.8		
9:30		Sample								
TYPE C	NT DOCUMEN DE PUMP ED BLADDER MCO BLADDER	TATION	X HIGH DENS	- R TEFLON LINED ITY POLYETHYLE	NE	POL'	PUMP MATERIAL YVINYL CHLORIDE NLESS STEEL		l l	TYPE OF BLADDER MATERIAL TEFLON OTHER
	EOPUMP		LDPE (Dedic	cated)		X SILIC	ON (Dedicated)			
ANALYTIC To Be Collecte	CAL PARAMET	ERS		HOD IBER		ESERVATION THOD	VOLUME REQUIRED	!	SAMPLE COLLECTED	
	Cs: Trimethylpent		8260 8270			L / 4 DEG. C EG. C	3 X 40 mL 2 X 1 L AG		VOC	
VPI	Н	JEI II	MA V			L / 4 DEG. C	3 X 40 mL		VPH	
Dis pH	solved Fe			6010B 4500 H+B		O3 / 4 DEG. C EG. C	1 X 500 mL 1 X 500 mL		Dis.	Fe
X Am	monia-Nitrogen		10-1	07-06-1	H25	SO4 / 4 DEG. C	1 X 250 mL		X Amm	nonia-Nitrogen
X Chl			300. 300.			EG. C EG. C	1 X 500 mL 1 X 500 mL		X Chlo	
	ecific Conductivity	1		2510B		EG. C	1 X 500 mL			cific Conductivity
X Dis	solved Al, Cr		DIS.	6010B	HNO	O3 / 4 DEG. C	1 X 500 mL		X Dis.	Al, Cr
PURGE O	BSERVATIONS	s				LOCATION	SKETCH			
PURGE WA		NO	NUMBER OF GA GENERATED	LLONS 1.1 g	gal.					
NOTES	Chloride and Su	Ifate analysis coll	ected in one 500m	L bottle						
						Sampled I				Wood
						Prepared Checked I				*****
SIGNATURE	E: Fiel	d Form w/ Signa	ature on File			OHECKED I	oy. O 1 IVI			

		MENT & INFRAST RECORD - L		•	ATER SA	MPLING				
PROJECT	OLIN CH	HEMICAL SUPERFUN	D SITE, WILMINGTO	ON, MA	WEL	L ID	PZ-17RRR]	ROUND NO. 1
SAMPLE ID)	OC-PZ17F	RRR		SITE T	YPE	Superfund		Ī	DATE 4/3/2019
TIME	START	14:45 E	END 15:30		JOB NUMBI	ER	6107190016]	BOTTLE TIME 15:19
		UMP SETTINGS		REMENT POINT						
	CTED ID	N/A	X TO	P OF WELL RISER P OF PROTECTIVE HER		PROTECTIVE CASING STIC (FROM GRO	CKUP	FT.	PROTE CASING DIFFER	A / WELL
INITIAL DE TO WA		1.94	FT. WELL D	6.20	FT.	PID AMBIENT AIF	R N/A	PPM	WELL DIAMET	TER 1.0 IN.
FINAL DE TO WA		Dry	FT. SCREEN		FT.	PID WELL MOUTH	N/A	PPM	WELL	YES NO N/A RITY: CAP X
DRAWDO VOLU (final - i	JME	N/A 6 {2-inch} or x 0.65 {4-	GAL. RATIO	OF DRAWDOWN TOTAL VOLUME PL	VOLUME	PRESSURE TO PUMP	N/A	PSI]	CASING X LOCKED X COLLAR X
TOTAL \ PURG	GED	0.2 ters per minute) x time	GAL.	N/A x 0 00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHA TIMER SETTIN	ARGE N/A SEC.
PURGE D		coro por minuto, x timo	- duration (minutes)			02111140			OLITIN	
TIME	DEPTH WATER (0.3)	R (ft.) (ml/min)	TEMP. (deg. C) (3%)	SPEC. COND. (µS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
15:03	4.2		14.10	1262	7.02	6.65	21.7	-3.7	~ 6.0 ft.	
	Well	•	e Recharge							
15:19	C	ollect Sample								
				 						
				<u> </u>						
TYPE C	NT DOCI DE PUMP ED BLADD MCO BLAD EOPUMP			R TEFLON LINED BITY POLYETHYLE	NE	POL	F PUMP MATERIAL LYVINYL CHLORIDE NINLESS STEEL CON (Dedicated)			TYPE OF BLADDER MATERIAL TEFLON OTHER
ANALYTIC	CAL PAR	AMETERS								
To Be Collecte	d			THOD <u>MBER</u>		ESERVATION THOD	VOLUME REQUIRED		SAMPLE COLLECTED	<u> </u>
		hylpentenes	826			L / 4 DEG. C	3 X 40 mL		VO	
SV0		A and BEHP	8270 MA	0 C VPH		EG. C L / 4 DEG. C	2 X 1 L AG 3 X 40 mL		SV0	OCs H
Dis	solved Fe			. 6010B 4500 H+B		03 / 4 DEG. C EG. C	1 X 500 mL 1 X 500 mL		Dis pH	. Fe
X Am	monia-Nitr	ogen		107-06-1		SO4 / 4 DEG.			X Am	monia-Nitrogen
X Chl			300. 300.			EG. C EG. C	1 X 500 mL 1 X 500 mL		X Chl	
. =	ecific Cond			2510B		EG. C	1 X 500 mL			ecific Conductivity
X Dis	solved AI,	Gr	DIS.	. 6010B	HN	O3 / 4 DEG. C	1 X 500 mL		X Dis	. AI, Cr
PURGE O	BSERVA	TIONS				LOCATION	SKETCH			
PURGE WA		YES NO	NUMBER OF GA GENERATED	ALLONS ~ 0.2 g	gal.					
NOTES	Chloride	and Sulfate analysis c	collected in one 500r	nL bottle						
	Well wen	t dry; sample recharge	е							
						Sampled	by: SAM			ر المام مام مام
							by: SAM			Wood.
SIGNIATI IRI	E .	Field Form w/ Sig	anature on Ella				by: CTM			

		* & INFRASTRU CORD - LOV		•		MPLING					
PROJECT	OLIN CHEMIC	AL SUPERFUND S	ITE, WILMINGTO	N, MA	WE	LL ID	PZ-18R]	ROUND	NO. 1
SAMPLE ID		OC-PZ-18R			SITE T	ГҮРЕ	Superfund]	DATE	4/3/2019
TIME	START	9:10 END	10:25		JOB NUMB	BER	6107190016			BOTTLE TIME	10:00
QC SAN	EVEL / PUMP : MPLE CTED ID	SETTINGS N/A	TOP	EMENT POINT OF WELL RIS OF PROTECT ER	SER	PROTECTIVE CASING STIC (FROM GROU	KUP	FT.	PROTE(CASING DIFFER	i / WELL	FT.
INITIAL DEI		1.78 FT				PID			WELL		
FINAL DEI		2.64 FT				AMBIENT AIR		PPM	DIAMET WELL	YES	NO N/A
DRAWDO VOLU (final - ir	JME	0.078 GAI ch} or x 0.65 {4-inch		1.6 OF DRAWDOW OTAL VOLUME		MOUTH PRESSURE TO PUMP	N/A	PPM PSI] INTEGR	CASING X CASING X LOCKED COLLAR	<u>X</u>
TOTAL V PURO (purge r	GED	1.54 GAI r minute) x time dur		0.05 0.00026 gal/ml	I)	REFILL TIMER SETTING	N/A	SEC.	DISCHA TIMER SETTIN	N/A	SEC.
PURGE DA	ATA										
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. CONI (μS/cm) (3%)	D. pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMN	MENTS
9:18	Start Pump								~ 5.0 ft.		
9:30	2.64	160	6.27	4966	6.10	3.06	10.7	52.0			
9:35	2.64	160	6.02	4937	6.30	1.04	6.99	37.0			
9:40	2.64	160	6.19	4885	6.35	1.15	6.01	34.1			
9:45 9:50	2.64	160	6.25 6.31	4840 4797	6.35 6.35	1.06 0.99	6.41 6.27	36.0 37.3			
9:55	2.64	160	6.35	4767	6.35	0.97	6.63	38.3			
10:00		Sample									
EQUIPMEN	NT DOCUMEN	TATION									
QE	<u>OF PUMP</u> ED BLADDER MCO BLADDER EOPUMP			TEFLON LINE TY POLYETHY		POL STA	PUMP MATERIAL YVINYL CHLORIDE INLESS STEEL CON (Dedicated)	=		TYPE OF BLADI TEFLON OTHER	DER MATERIAL
ANALYTIC To Be Collected	CAL PARAMET	TERS	METI NUM			RESERVATION ETHOD	VOLUME REQUIRED)	SAMPLE COLLECTED)	
	Cs: Trimethylpen	tenes	8260			CL / 4 DEG. C	3 X 40 mL	_	Voc	_	
svo	OCs: NDPA and		8270		4 [DEG. C	2 X 1 L AG		svo	OCs	
VPI Diss	H solved Fe		MA V	PH 6010B		CL / 4 DEG. C NO3 / 4 DEG. C	3 X 40 mL 1 X 500 mL		VPI Dis.		
рН			SM 4	500 H+B		DEG. C	1 X 500 mL		рН		
X Amı	monia-Nitrogen oride		10-10 300.0)7-06-1)		2SO4 / 4 DEG. (DEG. C	1 X 250 mL 1 X 500 mL		X Amr	monia-Nitrogen oride	
X Sulf	fate		300.0		4 [DEG. C	1 X 500 mL		X Sulf	fate	
_ = .	ecific Conductivity solved Al, Cr	1	SM 2	510B 6010B		DEG. C NO3 / 4 DEG. C	1 X 500 mL 1 X 500 mL		X Spe X Dis.	ecific Conductivity	
_ X Disc	solved Al, Ol		DIO.	30101	1111	1007 4 DLG. 0	1 X 300 IIIL		_ X _ DI3.	. Al, Ol	
	BSERVATION					LOCATION	SKETCH				
PURGE WA			NUMBER OF GAL GENERATED		.5 gal.						
NOTES	Chloride and Su	ılfate analysis colle	cted in one 500ml	_ bottle							
						Sampled				W	ood.
						Prepared				***	<i>-</i>
SIGNATURE	≣: Fiel	ld Form w/ Signat	ture on File			Checked	by: CIM				

			UCTURE SOLU W FLOW G	ITIONS, INC.	ATER SA	MPLING				
PROJECT	OLIN CHEMICA	AL SUPERFUND S	SITE, WILMINGTO	N, MA	WEL	L ID	PZ-24			ROUND NO. 1
SAMPLE ID		OC-PZ-24			SITE T	YPE	Superfund]	DATE 4/3/2019
TIME	START	7:50 END	10:02		JOB NUMBI	ER	6107190016]	BOTTLE TIME 9:55
QC SAN	EVEL / PUMP S	SETTINGS N/A	X TOF	REMENT POINT P OF WELL RISER P OF PROTECTIVE HER		PROTECTIVE CASING STIC (FROM GROU	KUP	FT.	PROTEC CASING DIFFERE	/ WELL
INITIAL DEI		8.12 F				PID			WELL	
FINAL DE		8.22 F	(TOR) T. SCREEN	17.86	FT.	AMBIENT AIR	N/A	PPM	DIAMETE WELL	ER <u>1.5 IN.</u> YES NO N/A
DRAWDC VOLU (final - i	IME <	<0.01 GA		5 OF DRAWDOWN \ OTAL VOLUME PU		MOUTH PRESSURE TO PUMP	N/A N/A	PPM	INTEGRI	TY: CAP X
TOTAL V	/OL.	4.62 GA		<0.01		REFILL TIMER SETTING	N/A	SEC.	DISCHAF TIMER SETTING	RGE N/A SEC.
PURGE D	ATA									
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (µS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
8:04	8.22	148	Connect YSI						~ 14 ft.	
8:10	8.22	148	6.71	1892	6.18	2.59	63.6	153.4		
8:30	8.22	148	6.81	1801	6.37	7.92	29.5	-1.7		
8:40 9:00	8.22 8.22	148 148	6.90 6.94	1805 1804	6.42	7.39 4.49	22.7 12.6	-9.4 -10.7		
9:10	8.22	148	6.79	1809	6.52	3.67	10.7	-8.0		
9:20	8.22	148	6.96	1808	6.56	3.05	8.58	-7.6		
9:30	8.22	148	7.08	1811	6.53	2.66	7.76	-6.2		
9:40	8.22	148	7.27	1810	6.60	2.38	3.87	-4.9		
9:45	8.22	148	7.37	1808	6.64	2.22	3.99	-5.2		
9:50	8.22	148	7.34	1814	6.61	2.07	3.45	-5.2		
9:55 EQUIDME	NT DOCUMEN	Sample								
TYPE C	DE PUMP ED BLADDER MCO BLADDER EOPUMP			- TEFLON LINED TY POLYETHYLE!	NE	POL STA	PUMP MATERIAL YVINYL CHLORIDE INLESS STEEL CON (Dedicated)			TYPE OF BLADDER MATERIAL TEFLON OTHER
ANALYTIC To Be Collected	CAL PARAMET	ERS	MET <u>NUM</u>			ESERVATION THOD	VOLUME REQUIRED		SAMPLE COLLECTED	
SVC	Cs: Trimethylpent DCs: NDPA and E		8260 8270	C	HC 4 D	L / 4 DEG. C DEG. C	3 X 40 mL 2 X 1 L AG		VOC SVO	Cs
pH X Amı	solved Fe		SM 4	6010B 4500 H+B 07-06-1	HN 4 D H29	L / 4 DEG. C O3 / 4 DEG. C DEG. C SO4 / 4 DEG. C				Fe nonia-Nitrogen
X Sul	X Ammonia-Nitrogen 10-107-06-1 X Chloride 300.0 X Sulfate 300.0 X Specific Conductivity SM 2510B				4 D 4 D	DEG. C DEG. C DEG. C	1 X 500 mL 1 X 500 mL 1 X 500 mL			ate cific Conductivity
X Diss	solved AI, Cr		DIS.	6010B	HN	O3 / 4 DEG. C	1 X 500 mL		X Dis.	Al, Cr
PURGE WA			NUMBER OF GA			LOCATION	SKETCH			
NOTES		•	GENERATED ected in one 500m	~ 4.6 g	al.					
						Sampled	·			wood
SIGNATURE	NATURE: Field Form w/ Signature on File					Prepared Checked				*******

			UCTURE SOLU W FLOW G	ITIONS, INC. ROUNDWA	TER SA	MPLING				
PROJECT	OLIN CHEMICA	AL SUPERFUND S	SITE, WILMINGTO	N, MA	WEL	L ID	PZ-25			ROUND NO. 1
SAMPLE ID		OC-PZ-25			SITE T	YPE	Superfund			DATE 4/3/2019
TIME	START	10:06 END	11:55		JOB NUMBE	ER	6107190016]	BOTTLE TIME 11:50
WATER LE QC SAM COLLEC		SETTINGS N/A	X TOP	EMENT POINT OF WELL RISER OF PROTECTIVE	CASING	PROTECTIVE CASING STIC (FROM GROU	KUP	FT.	PROTEC CASING / DIFFERE	/ WELL
INITIAL DEF		7.89 F				PID	N/A		WELL	
FINAL DEF		7.89 F1	(TOR) T. SCREEN	16.52	FT.	AMBIENT AIR PID WELL	N/A	PPM	DIAMETE WELL	ER 1.5 IN. YES NO N/A
DRAWDO VOLU (final - ir	ME <	<0.01 GA		5 OF DRAWDOWN VIOTAL VOLUME PUI		MOUTH PRESSURE TO PUMP	N/A	PPM	INTEGRI	TY: CAP X
TOTAL V	OL.	4.02 GA		<0.01 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHAR TIMER SETTING	RGE N/A SEC.
PURGE DA	ATA									
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (μS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
10:20	7.90	156	Connect YSI						~ 13 ft.	
10:25	7.90	156	7.51	1360	6.43	1.94	92.2	53.9		
10:45	7.90	156 156	7.78 8.12	1336 1326	6.40	1.83 1.65	36.6 14.3	61.9		
11:05 11:15	7.90 7.90	156	8.10	1328	6.38	1.66	11.5	63.1 63.7		
11:25	7.90	156	8.35	1325	6.39	1.54	9.19	64.1		
11:35	7.90	156	8.44	1325	6.36	1.46	4.91	64.7		
11:40	7.90	156	8.41	1325	6.35	1.50	4.40	64.5		
11:45	7.90	156	8.49	1322	6.36	1.52	3.51	65.2		
11:50	Collect	Sample								
TYPE O	NT DOCUMEN' F PUMP D BLADDER MCO BLADDER OPUMP			- TEFLON LINED TY POLYETHYLEN	NE	POL STAI	PUMP MATERIAL YVINYL CHLORIDE NLESS STEEL CON (Dedicated)			TYPE OF BLADDER MATERIAL TEFLON OTHER
ANALYTIC To Be Collected	AL PARAMET	ERS	METI NUM			ESERVATION THOD	VOLUME REQUIRED		SAMPLE COLLECTED	
voo	Cs: Trimethylpent	tenes	8260			L / 4 DEG. C	3 X 40 mL		VOC	s
SVC	OCs: NDPA and E	BEHP	8270 MA V			EG. C L / 4 DEG. C	2 X 1 L AG 3 X 40 mL		SVO	
Diss	solved Fe			6010B	HNO	O3 / 4 DEG. C	1 X 500 mL		Dis. F	
pH X Amr	monia-Nitrogen			500 H+B)7-06-1		EG. C SO4 / 4 DEG. C	1 X 500 mL 1 X 250 mL		pH X Amm	nonia-Nitrogen
X Chlo	oride		300.0)	4 D	EG. C	1 X 500 mL		X Chlor	ride
X Sulf			300.0 SM 2			EG. C EG. C	1 X 500 mL 1 X 500 mL		X Sulfa	ate offic Conductivity
	X Specific Conductivity SM 2510B X Dissolved AI, Cr DIS. 6010B					O3 / 4 DEG. C	1 X 500 mL		X Dis. A	
PURGE OF	BSERVATIONS					LOCATION	SKETCH			
PURGE WA' CONTAINER			NUMBER OF GAI GENERATED	LONS ~ 4.0 ga	al					
NOTES	Chloride and Su	Ifate analysis colle	ected in one 500m	L bottle						
	SIGNATURE: Field Form w/ Signature on File					Sampled Prepared Checked	by: SAM			wood

		& INFRASTRU CORD - LO		•	ATER SA	MPLING					
PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA		WEI	WELL ID GW-16R				ROUND	NO. 1		
SAMPLE ID		OC-GW-16F	3		SITE T	E TYPE Superfund]	DATE	4/3/2019	
TIME	START	8:00 END	9:25		JOB NUMB	ER	6107190016			BOTTLE TIME	8:55
QC SAN	EVEL / PUMP S MPLE CTED ID	SETTINGS N/A	X TOP	EMENT POINT OF WELL RISEI OF PROTECTIV ER		PROTECTIVE CASING STIC (FROM GROU	KUP	FT.	PROTEG CASING DIFFER	/ WELL	FT.
INITIAL DE		10.47 F1				PID			WELL		
FINAL DE		10.82 F1	(TOR) T. SCREEN	~ 17.2	P. FT.	AMBIENT AIR	N/A	PPM	DIAMET WELL	ER 2 YES	IN. NO N/A
DRAWDC VOLU (final - i	IME (0.056 GA h} or x 0.65 {4-incl		5 DF DRAWDOWN DTAL VOLUME P		MOUTH PRESSURE TO PUMP	N/A	PPM	INTEGR	TY: CAP	$\equiv \equiv$
TOTAL V PURO (purge r	GED	1.46 GA minute) x time du		0.04 0.00026 gal/ml)		REFILL TIMER SETTING	N/A	SEC.	DISCHA TIMER SETTING	RGE N/A	SEC.
PURGE D	ATA										
TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (μS/cm) (3%)	pH (units) (+/- 0.1	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMM	ENTS
8:05	Start Pump								~ 15 ft.		
8:10	10.79	125	7.91	194	6.11	1.73	33.7	10.1			
8:15	10.81	125	7.93	193	6.12	1.59	10.5	11.1			
8:20 8:25	10.82 10.80	125 125	7.60 7.51	190 186	6.17	1.31 0.93	9.64 11.4	14.9 18.5			
8:30	10.81	125	7.55	185	6.27	0.75	9.76	19.4			
8:35	10.80	125	7.47	184	6.30	0.69	9.94	20.2			
8:40	10.82	125	7.78	184	6.35	0.73	9.53	18.7			
8:45	10.82	125	7.67	184	6.38	0.67	9.50	18.8			
8:50	10.82	125	7.71	184	6.39	0.72	9.47	18.6			
8:55	Collect	Sample									
TYPE C	NT DOCUMEN OF PUMP ED BLADDER MCO BLADDER EOPUMP		X HIGH DENSI	- TEFLON LINED TY POLYETHYLE	ENE	POL STA	F PUMP MATERIAL YVINYL CHLORIDE INLESS STEEL CON (Dedicated)	<u> </u>		TYPE OF BLADD TEFLON OTHER	ER MATERIAL
	CAL PARAMET	FRS	LDPE (Dedic	ated)		X SILIC	CON (Dedicated)				
To Be Collected		ENS	MET NUM			ESERVATION THOD	VOLUME REQUIRED	1	SAMPLE COLLECTED	!	
X SVC X VPH X Diss X pH X Ami Chl Sul	Cs: Trimethylpeni DCs: NDPA and fill solved Fe monia-Nitrogen oride fate ecific Conductivity solved AI, Cr	3EHP	SM 4 10-10 300.0 300.0 SM 2	C PH 6010B 500 H+B)7-06-1	4 E HC HN 4 E H2: 4 E 4 E	il / 4 DEG. C il / 6 DEG. C il / 6 DEG. C il / 6 DEG. C il / 6 DEG. C	1 X 500 mL 1 X 250 mL 1 X 500 mL 1 X 500 mL 1 X 500 mL		Chlo	OCs H Fe monia-Nitrogen oride	
PURGE OF PURGE WAS CONTAINED			NUMBER OF GAI GENERATED	LONS ~ 1.5	gal.	LOCATION	SKETCH				
SIGNATURE	E. Fjal	d Form w/ Signa	iture on File			Sampled Prepared Checked	by: SAM			WC	od.

WOOD ENVIRONMENT &	INFRASTRUCTURE SOLU	TIONS, INC.				PAGE 1 OF 1
FIELD DATA RECO	RD - SURFACE WA	TER				
PROJECT OLIN CHEMICAL S	SUPERFUND SITE, WILMING	ON, MA JOB N	UMBER 6	6107190016	DATE 4/2/2019	
FIELD SAMPLE ID	OC-SW-ISCO2	ACTIVITY TIME	START 13:05	END 1	3:15 BO	TTLE TIME 13:10
QC SAMPLES COLLECTED	N/A					
SURFACE WATER DATA		<u>'</u>	EQUIPMENT USED	TYPE C	F SURFACE WATE	ER
WATER DEPTH	SPEC. COND		BEAKER	X	STREAM/ DITCH	DECON FLUIDS USED:
AT LOCATION 0.5		887 μS/cm	PACS BOMB		LAKE/ POND	DI WATER
DEPTH OF SAMPLE FROM SURFACE	0.25 ft. D.O.	.40 mg/L	X PERISTALTIC P	UMP	SEEP	POTABLE WATER
TEMPERATURE 9.07	SALINITY DEG C	%	X FILTER (0.45 m	iicron)	MARSH	NONE
TURBIDITY	ORP	70	X LDPE Tubing & \$	Silicon	OTHER South Ditc	h
4.45	NTU	44.7 mV				
рН 6.24	UNITS		Notes: Location prio	or to discharge into t	he East Ditch	
SEDIMENT DATA						
SEDIMENT SAMPLE START DEPT	H TYPE OF SEDIMEN	т	EQUIPMENT FOR COLLECTION	ON DECON FLUID	S USED	
END DEPTH	ORG	ANIC	HAND AUGER	DI WATE	R	
TYPE OF SAMPLE GRAB	SANI		S.S. SPOON	POTABLE	WATER	
SAMPLE OBSERVATIONS	GRA'	EL .	ALUMINIUM PAN	LIQUINO	(
ODOR	CLAY		DREDGE	OTHER_		-
COLOR	ОТН	R	OTHER			
FLOC OBSERVED	CLEAR OF LEA	LITTER	<u> </u>			
ANALYTICAL PARAMETERS SURFACE WATER) METHO)	PRESERVATION	VOLUME	SAMPLE	
	NUMBE	R FILTERED	METHOD F	REQUIRED C	COLLECTED	
X Ammonia-Nitrogen X Nitrate / Nitrite	10-107-0 300.0	<u>N</u> N		1 X 250 mL 1 X 500 mL	X	
X Chloride	300.0	N		1 X 500 mL	X	
X Sulfate	300.0	N		1 X 500 mL	X	
X Specific Conductivity X Total Al, Cr, Na	SM 2510 Total 60			1 X 500 mL 1 X 500 mL	X	
X Dissolved Al, Cr, Na	DIS. 601			1 X 500 mL	X	
ANALYTICAL PARAMETERS		<u> </u>				
SEDIMENT	METH <u>NUM</u> I			VOLUME REQUIRED (SAMPLE COLLECTED	
% Solids / Moisture	160.3		4 DEG. C 1	1 X 8 oz.		
Total Al, Cr, Fe	Total 60	<u>10B</u>	4 DEG. C 1	1 X 8 oz.		
l H ———					H	
						
					H	
NOTES						
						wood.
SIGNATURE: Field F	orm w/ Signature on File					Sampled by: CTM
						Prepared by: SAM Checked by: CTM

WOOD ENVIRONMENT &						PAGE 1 OF 1
FIELD DATA RECO	RD - SURFACE WA	TER				
PROJECT OLIN CHEMICAL S	SUPERFUND SITE, WILMING	6107190016	DAT	TE 4/2/2019		
FIELD SAMPLE ID	OC-SW-ISCO3	ACTIVITY TIME	START 12:52	END 13	3:05 BO	TTLE TIME 13:00
QC SAMPLES COLLECTED	N/A					
SURFACE WATER DATA		_	EQUIPMENT USED	TYPE O	F SURFACE WATE	:R
WATER DEPTH	SPEC. COND		BEAKER	X	STREAM/ DITCH	DECON FLUIDS USED:
AT LOCATION 0.6		1,054 μS/cn	PACS BOMB		LAKE/ POND	DI WATER
DEPTH OF SAMPLE FROM SURFACE	0.30 ft. D.O.	1.50 mg/L	X PERISTALTIC P	UMP	SEEP	POTABLE WATER
TEMPERATURE 14.34	SALINITY DEG C	%	X FILTER (0.45 m	icron)	MARSH	NONE
TURBIDITY	ORP	/6	X LDPE Tubing & S	Silicon	OTHER East Ditch	
2.75	NTU	107.6 mV				
рН 6.82	UNITS		Notes: East Ditch; U	Jp-stream of South [Ditch confluence; Alc	ong Railway
SEDIMENT DATA						
SEDIMENT SAMPLE START DEPT	H TYPE OF SEDIME	NT	EQUIPMENT FOR COLLECTION	ON DECON FLUID	S USED	
END DEPTH	OR	GANIC	HAND AUGER	DI WATEF	3	
TYPE OF SAMPLE GRAB	sar	ID	S.S. SPOON	POTABLE	WATER	
SAMPLE OBSERVATIONS	GR.	AVEL	ALUMINIUM PAN	LIQUINOX	(
ODOR		Υ	DREDGE	OTHER _		-
COLOR	от	IER	OTHER			
FLOC OBSERVED	CLEAR OF LE	AF LITTER				
ANALYTICAL PARAMETERS SURFACE WATER) METH	חמ	PRESERVATION	VOLUME	SAMPLE	
	NUMB	FILTERED	METHOD F	REQUIRED C	OLLECTED	
X Ammonia-Nitrogen X Nitrate / Nitrite	<u>10-107</u> 300.0	-06-1 N N		1 X 250 mL 1 X 500 mL	X	
X Chloride	300.0	N N		1 X 500 mL	X	
X Sulfate	300.0	N		1 X 500 mL	Х	
X Specific Conductivity X Total Al, Cr, Na	SM 25 Total 6			1 X 500 mL 1 X 500 mL	X	
X Dissolved Al, Cr, Na	DIS. 60			1 X 500 mL	X	
					Ħ	
ANALYTICAL PARAMETERS						
SEDIMENT		HOD BER		VOLUME REQUIRED C	SAMPLE COLLECTED	
% Solids / Moisture	160.3			1 X 8 oz.		
Total Al, Cr, Fe	Total 6	010B	4 DEG. C 1	1 X 8 oz.		
l H ———		<u> </u>				
					H	
					H	
NOTES						
						wood.
SIGNATURE: Field F	orm w/ Signature on File					Sampled by: CTM
						Prepared by: SAM Checked by: CTM

WOOD ENVIRONMENT & IN	FRASTRUCTURE SOLUT	IONS, INC.				PAGE 1 OF 1
FIELD DATA RECOR	D - SURFACE WAT	ER				
PROJECT OLIN CHEMICAL SU	PERFUND SITE, WILMINGT	ON, MA JOB NU	MBER 6	6107190016	DA	TE 4/2/2019
FIELD SAMPLE ID	OC-SW-PZ16RRR	ACTIVITY TIME	START 13:25	END 1	3:35 во	TTLE TIME 13:30
QC SAMPLES COLLECTED	N/A					
SURFACE WATER DATA			EQUIPMENT USED	TYPE C	F SURFACE WATE	ER
WATER DEPTH	SPEC. COND		BEAKER	_	STREAM/ DITCH	DECON FLUIDS USED:
AT LOCATION 0.40	ft.	1,020 μS/cm	PACS BOMB	_	LAKE/ POND	DI WATER
DEPTH OF SAMPLE FROM SURFACE	0.20 ft. D.O. 10.	57 mg/L	X PERISTALTIC PI	UMP	SEEP	POTABLE WATER
TEMPERATURE 10.41 c	SALINITY DEG C	%	X FILTER (0.45 m	icron)	MARSH	NONE
TURBIDITY	ORP	/6	X LDPE Tubing & S	Silicon	OTHER South Ditc	h
3.84		80.5 mV				
pH 6.07 ι	JNITS		Notes: At location P.	Z-16RRR		
SEDIMENT DATA						
SEDIMENT SAMPLE START DEPTH	TYPE OF SEDIMENT		EQUIPMENT FOR COLLECTION	ON DECON FLUID	S USED	
END DEPTH	ORGA	NIC	HAND AUGER	DI WATE	3	
TYPE OF SAMPLE GRAB	SAND		S.S. SPOON	POTABLE	WATER	
SAMPLE OBSERVATIONS	GRAVI	EL	ALUMINIUM PAN	LIQUINO	(
ODOR	CLAY		DREDGE	OTHER_		_
COLOR	OTHE	·	OTHER			
FLOC OBSERVED	CLEAR OF LEAF	LITTER	<u></u>			
ANALYTICAL PARAMETERS SURFACE WATER	METHOD		PRESERVATION	VOLUME	SAMPLE	
<u></u>	NUMBER	FILTERED	METHOD F	REQUIRED C	COLLECTED	
X Ammonia-Nitrogen X Nitrate / Nitrite	<u>10-107-0</u> 300.0			1 X 250 mL 1 X 500 mL	X	
X Chloride	300.0			1 X 500 mL	X	
X Sulfate	300.0			1 X 500 mL	X	
X Specific Conductivity X Total Al, Cr, Na	SM 2510I Total 601			1 X 500 mL 1 X 500 mL	X	
X Dissolved Al, Cr, Na	DIS. 6010			1 X 500 mL	X	
ANALYTICAL PARAMETERS						
SEDIMENT	METHO NUMB			VOLUME REQUIRED (SAMPLE COLLECTED	
% Solids / Moisture	160.3			1 X 8 oz.		
Total Al, Cr, Fe	Total 601	<u>OB</u>	4 DEG. C 1	1 X 8 oz.		
l		<u> </u>				
					H	
						
		_				
NOTES						
						wood.
SIGNATURE: Field Forn	m w/ Signature on File					Sampled by: CTM
						Prepared by: SAM Checked by: CTM

WOOD ENVIRONMENT & IN	IFRASTRUCTURE SOLUT	IONS, INC.				PAGE 1 OF 1
FIELD DATA RECOR	RD - SURFACE WAT	ER				
PROJECT OLIN CHEMICAL SU	JPERFUND SITE, WILMINGT	ON, MA JOB N	UMBER	6107190016	DAT	E 4/2/2019
FIELD SAMPLE ID	OC-SW-PZ17RRR	ACTIVITY TIME	START 13:35	END 1	3:45 вот	TLE TIME 13:40
QC SAMPLES COLLECTED	N/A					
SURFACE WATER DATA			EQUIPMENT USED) TYPE O	F SURFACE WATER	3
WATER DEPTH	SPEC. COND		BEAKER		STREAM/ DITCH	DECON FLUIDS USED:
AT LOCATION 0.50	ft.	1,041 μS/cm	PACS BOMB	_	LAKE/ POND	DI WATER
DEPTH OF SAMPLE FROM SURFACE	0.25 ft. D.O. 11	.13 mg/L	X PERISTALTIC I	PUMP	SEEP	POTABLE WATER
TEMPERATURE 9.85	SALINITY DEG C	%	X FILTER (0.45 r	micron)	MARSH	NONE
TURBIDITY	ORP	/6	X LDPE Tubing &	Silicon	OTHER South Ditch	
2.08		82.8 mV				
рН 5.95 (UNITS		Notes: At location	PZ-17RRR		
SEDIMENT DATA	_ <u></u>					
SEDIMENT SAMPLE START DEPTH	TYPE OF SEDIMEN		EQUIPMENT FOR COLLECT	TION DECON FLUID	S USED	
END DEPTH	ORGA	NIC	HAND AUGER	DI WATER	3	
TYPE OF SAMPLE GRAB	SAND		S.S. SPOON	POTABLE		
SAMPLE OBSERVATIONS	GRAV	EL	ALUMINIUM PAN	LIQUINO	(
ODOR	CLAY	_	DREDGE	OTHER _		
COLOR FLOC OBSERVED	CLEAR OF LEAF		OTHER			
ANALYTICAL PARAMETERS						
SURFACE WATER	METHOI <u>NUMBE</u> F		PRESERVATION METHOD	VOLUME REQUIRED C	SAMPLE COLLECTED	
X Ammonia-Nitrogen	10-107-0		H2SO4 / 4 DEG. C	1 X 250 mL	X	
X Nitrate / Nitrite X Chloride	300.0	N	4 DEG. C	1 X 500 mL	X	
X Chloride X Sulfate	300.0 300.0	NN	4 DEG. C 4 DEG. C	1 X 500 mL 1 X 500 mL	X	
X Specific Conductivity	SM 2510		4 DEG. C	1 X 500 mL	X	
X Total Al, Cr, Na	Total 601		HNO3 / 4 DEG. C	1 X 500 mL	X	
X Dissolved Al, Cr, Na	DIS. 601	<u>Y</u>	HNO3 / 4 DEG. C	1 X 500 mL	X	
ANALYTICAL PARAMETERS SEDIMENT	METH	OD	PRESERVATION	VOLUME	SAMPLE	
	NUMB		<u>METHOD</u>	REQUIRED C	COLLECTED	
% Solids / Moisture Total Al, Cr, Fe	<u>160.3</u> Total 601	 0B	4 DEG. C 4 DEG. C	1 X 8 oz. 1 X 8 oz.	H	
10141711, 01, 10	10101001	<u> </u>	4 DEG. 0	17002.	H	
					Ħ	
NOTES						
						Wood.
CIONATURE, ELLE	m w/ Cimpature c = Ell-					
SIGNATURE: Field For	III w/ Signature on File					Sampled by: CTM
						Prepared by: SAM Checked by: CTM

WOOD ENVIRONMENT & I	NFRASTRUCTURE SOLU	TIONS, INC.			PAGE 1 OF 1
FIELD DATA RECO	RD - SURFACE WAT	ER			
PROJECT OLIN CHEMICAL S	UPERFUND SITE, WILMING	ON, MA JOB NU	MBER 6	DATE 4/2/2019	
FIELD SAMPLE ID	OC-SW-PZ18R	ACTIVITY TIME	START 14:00	END 14:08	BOTTLE TIME 14:05
QC SAMPLES COLLECTED	N/A				
SURFACE WATER DATA			EQUIPMENT USED	TYPE OF SUR	FACE WATER
WATER DEPTH	SPEC. COND		BEAKER	X STRE	AM/ DITCH DECON FLUIDS USED:
AT LOCATION 0.60		2,254 μS/cm	PACS BOMB	LAKE/	POND DI WATER
DEPTH OF SAMPLE FROM SURFACE	0.30 ft. D.O. 11	.21 mg/L	X PERISTALTIC PU	JMP SEEP	POTABLE WATER
TEMPERATURE 9.10	SALINITY DEG C	%	X FILTER (0.45 mi	cron) MARSI	H NONE
TURBIDITY	ORP		X LDPE Tubing & S	Silicon X OTHER	R: Weir Area
1.87	NTU 1	48.1 mV			
рН 5.94	UNITS		Notes: At location P2	Z-18R	
SEDIMENT DATA					
SEDIMENT SAMPLE START DEPTH	TYPE OF SEDIMEN	- Г	EQUIPMENT FOR COLLECTION	DECON FLUIDS USED	
END DEPTH	ORG	NIC	HAND AUGER	DI WATER	
TYPE OF SAMPLE GRAB	SAND	L	S.S. SPOON	POTABLE WATER	l .
SAMPLE OBSERVATIONS	GRAV	EL [ALUMINIUM PAN	LIQUINOX	
ODOR	CLAY	L	DREDGE	OTHER	
COLOR	OTHE	R	OTHER		
FLOC OBSERVED	CLEAR OF LEAR	LITTER	<u> </u>		
ANALYTICAL PARAMETERS SURFACE WATER	METHO)	PRESERVATION	VOLUME SAMF	PLE
_	NUMBE	<u>FILTERED</u>	METHOD R	REQUIRED COLLEC	<u>CTED</u>
X Ammonia-Nitrogen X Nitrate / Nitrite	<u>10-107-0</u> 300.0			X 250 mL X X 500 mL X	
X Chloride	300.0		_	X 500 mL X	
X Sulfate	300.0		_	X 500 mL X	
X Specific Conductivity X Total AI, Cr, Na	SM 2510 Total 60			X 500 mL X X 500 mL X	
X Dissolved Al, Cr, Na	DIS. 601			X 500 mL X	
ANALYTICAL PARAMETERS	_		_	_	
SEDIMENT	METH <u>NUM</u> E			VOLUME SAMF REQUIRED COLLEC	
% Solids / Moisture	160.3			X 8 oz.	<u> </u>
Total Al, Cr, Fe	Total 60	<u>0B</u>	4 DEG. C 1	X 8 oz.	
l		 .			
		 -]]
					<u>.</u> 1
	_				
NOTES					
					wood.
					,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
SIGNATURE: Field Fo	orm w/ Signature on File				Sampled by: CTM
					Prepared by: SAM Checked by: CTM

WOOD ENVIRONMENT & I	NFRASTRUCTURE SOLU	TIONS, INC.			PAGE 1 OF 1
FIELD DATA RECO	RD - SURFACE WAT	ER			
PROJECT OLIN CHEMICAL S	UPERFUND SITE, WILMING	ON, MA JOB NUI	MBER 6	107190016	DATE 4/2/2019
FIELD SAMPLE ID	OC-SW-SD17	ACTIVITY TIME	START 13:50	END 14:00	BOTTLE TIME 13:55
QC SAMPLES COLLECTED	N/A				
SURFACE WATER DATA			EQUIPMENT USED	TYPE OF SUF	RFACE WATER
WATER DEPTH	SPEC. COND		BEAKER		AM/ DITCH DECON FLUIDS USED:
AT LOCATION 0.30	O ft.	1,044 μS/cm	PACS BOMB		POND DI WATER
DEPTH OF SAMPLE FROM SURFACE	0.20 ft. D.O. 8.	83 mg/L	X PERISTALTIC PL	JMP SEEP	POTABLE WATER
TEMPERATURE 10.13	SALINITY	%	X FILTER (0.45 mi	cron) MARS	H NONE
TURBIDITY	DEG C ORP	%	X LDPE Tubing & S	Silicon X OTHE	R South Ditch
1.99		79.7 mV			
pH 5.90	UNITS		Notes: Up-stream of	location PZ-17RRR	
SEDIMENT DATA					
SEDIMENT SAMPLE START DEPTH	TYPE OF SEDIMEN	·	EQUIPMENT FOR COLLECTIC	DECON FLUIDS USED	
END DEPTH	ORGA	NIC	HAND AUGER	DI WATER	
TYPE OF SAMPLE GRAB	SAND		S.S. SPOON	POTABLE WATER	3
SAMPLE OBSERVATIONS	GRAV	EL	ALUMINIUM PAN	LIQUINOX	
ODOR	CLAY		DREDGE	OTHER	
COLOR	OTHE	R	OTHER		
FLOC OBSERVED	CLEAR OF LEAR	LITTER	<u> </u>		
ANALYTICAL PARAMETERS SURFACE WATER	METHO)	PRESERVATION	VOLUME SAMI	PI F
	NUMBE	<u>FILTERED</u> !	METHOD R	REQUIRED COLLE	<u>CTED</u>
X Ammonia-Nitrogen X Nitrate / Nitrite	<u>10-107-0</u> 300.0			X 250 mL X X 500 mL X	
X Chloride	300.0			X 500 mL X]
X Sulfate	300.0			X 500 mL X	
X Specific Conductivity X Total AI, Cr, Na	SM 2510 Total 60			X 500 mL X X 500 mL X	
X Dissolved Al, Cr, Na	DIS. 601			X 500 mL X	
ANALYTICAL PARAMETERS					<u> </u>
SEDIMENT	METH NUME			VOLUME SAMI REQUIRED COLLE	
% Solids / Moisture	160.3			X 8 oz.	
Total Al, Cr, Fe	Total 60	<u>0B</u>	4 DEG. C 1	X 8 oz.	
l H ———					4
H ———		 -			<u></u>
					1
	<u> </u>]
NOTES					
					wood.
SIGNATURE: Field Fo	orm w/ Signature on File				Sampled by: CTM
					Prepared by: SAM Checked by: CTM

	NFRASTRUCTURE SOLUTI				PAGE 1 OF 1
	RD - SURFACE WAT				
PROJECT OLIN CHEMICAL S	UPERFUND SITE, WILMINGTO	ON, MA JOB NUMBE	ER 61071	90016	DATE
FIELD SAMPLE ID		ACTIVITY TIME STA	ART END		BOTTLE TIME
QC SAMPLES COLLECTED	N/A				
SURFACE WATER DATA			EQUIPMENT USED	TYPE OF SURFACE	WATER
WATER DEPTH AT LOCATION	SPEC. COND	μS/cm	BEAKER	X STREAM/ DIT	TCH DECON FLUIDS USED:
DEPTH OF SAMPLE	D.O.	дологи	PACS BOMB	LAKE/ POND	DI WATER
FROM SURFACE	ft.		X PERISTALTIC PUMP	SEEP	POTABLE WATER
TEMPERATURE	DEG C SALINITY	%	X FILTER (0.45 micron)	MARSH	NONE
TURBIDITY	ORP NTU	mV	X LDPE Tubing & Silicon	OTHER	
рН	UNITS	IIIV			
SEDIMENT DATA					
SEDIMENT SAMPLE START DEPTH	TYPE OF SEDIMENT	EQU	JIPMENT FOR COLLECTION	DECON FLUIDS USED	
END DEPTH	ORGAN	IC	HAND AUGER	DI WATER	
TYPE OF SAMPLE GRAB	SAND		S.S. SPOON	POTABLE WATER	
SAMPLE OBSERVATIONS	GRAVE		ALUMINIUM PAN	LIQUINOX	
ODOR	CLAY		DREDGE	OTHER	
COLOR	OTHER		OTHER		
FLOC OBSERVED	CLEAR OF LEAF	LITTER	-		
ANALYTICAL PARAMETERS SURFACE WATER	METHOD	PRI	ESERVATION VOLUM	ME SAMPLE	
X Ammonia-Nitrogen	NUMBER 10-107-06		<u>THOD</u> <u>REQUIP</u> SO4 / 4 DEG. C 1 X 250		
X Nitrate / Nitrite	10-107-06 300.0		DEG. C 1 X 500	mL X	
X Chloride	300.0		DEG. C 1 X 500	mL X	
X Sulfate X Specific Conductivity	300.0 SM 2510B		DEG. C 1 X 500 DEG. C 1 X 500		
X Total Al, Cr, Na	Total 6010		IO3 / 4 DEG. C 1 X 500		
X Dissolved Al, Cr, Na	DIS. 6010I	3 Y HNO	103 / 4 DEG. C 1 X 500	mL X	
ANALYTICAL PARAMETERS SEDIMENT	METHO	D PB	RESERVATION VOLUM	ME SAMPLE	
<u></u>	NUMBE	<u>R</u>	METHOD REQUIR	ED COLLECTED	
% Solids / Moisture Total Al, Cr, Fe	160.3 Total 6010		DEG. C 1 X 8 oz DEG. C 1 X 8 oz		
100074, 01, 10	<u>10ta 0010</u>	<u> </u>	17002		
		_			
		<u> </u>			
		<u> </u>			
NOTES					wood.

SIGNATURE:					Constitution
					Sampled by: Prepared by: Checked by:

Appendix B

Chain of Custody Records

10 Hazelwood Drive
Amherst, NY 14228-2298 360325-Boston

380325 Boston Chain of Custody Record

360325-Boston



Phone (716) 691-2600 Fax (716) 691-7991 Client Information	Sampler:	s Mas	rolini	Lab PN Maso		cky C					Carrier T	racking	No(s):		COC No: 480-128	049-2891	8.1		
Client Contact: Mr. Brian Guichard	Phone: 338	927	3796	E-Mail: becky	maso	on@	testar	meric	ainc.c	om	7				Page: Page 1 d	of 1			
Company: Olin Corporation		701		1			100101			lysis Re	aueste	d			Job #:				
Address:	Due Date Request	ed:				Г	Τ.						TT		Preserva	tion Code	s:		
51 Eames street City:	TAT Requested (d	ays): A		-				Filters/				1	- 1 1		A - HCL B - NaOH		M - Hexan N - None	е	
Wilmington		udard		1		1		1/4				1 1	1 1		C - Zn Ac		O - AsNaC	02	
State, Zip: MA, 01887											11	1188		.	111 11111 1111				
Phone: 423-336-4012(Tel)	PO #: REWI0025				0			Field				Ш						/d	Irate
Email: beguichard@olin.com	WO #:				0 (o	9			Φ.			Ш							
Project Name: 01 2519	Project #:				(Yes or	Sulfate	nia		ctanc			480	0-151331	Chain	of Custo	dv dv		1	
Site:	48019903 SSOW#:	48019903 ssow#:				ంర	٦	AI, Cr	Conductance				11	F107 10		-,			
Olin - Wilmigton, Volt				-	S/WS	Chloride			Specific (oer of					
		1	Type	latrix	iltere m MS		0	6010MCP - Diss.	- Spe					Total Number					
Samuela Idantification	Samula Data	Sample	(C=comp, O=	ater, S=solid, waste/oil,	Field Filter Perform M	300.0 Z8D	50.1 -	010M	2510B -					otal		! . ! ! !	A 4	-/51-4	
Sample Identification	Sample Date	Time	G=grab) BT=TH		XX	N	S	- DESTRUCTOR'S	N					X	31	pecial Ins	truction	s/Note:	
OC-GW-202S	4/3/09	0800	G V	Vater	YN	1	1	1	1					4			and the second		
OC-GW-202D	4/3/19	0900	G V	Vater	11	Î	1	Ì	1					1					
OC GW-25	1		V	Vater			-	H								eru	^		_
OC-GW-78S	4/3/19	1435	G V	Vater	111		1	1	Π					1					
QC-GW-79S	(-)		V	Vater	H	+	#	1		-	-	-				CTV	_	-	_
OC-PZ-16RRR			V	Vater	#	H	#	1				+				C			
OC-PZ-17RRR	4/3/19	1519	G- V	Vater	111	1	1	T	\Box										
OC-PZ-18R	4/3/19	1000		Vater		1													
OC-PZ-24	4/3/19	0955	G V	Vater	111	1													
OC-PZ-25	4/3/19	1150	av	Vater	44	1	4	V	V					1	,				
			1	Water		-	-								C	nu	- 4	1/3/1	9
Possible Hazard Identification					Sa					ee may be			amples ar	e retair	ned longe	er than 1			
Non-Hazard Flammable Skin Irritant Deliverable Requested: I, II, III, IV, Other (specify)	Poison B Unkr	own -	Radiological		Sr	_			Client	Requiren	Disposa	l By La	b	Arch	ive For_		Month	is	
		To .					11 11131	ructic	71137020	rtequirei									
Empty Kit Relinquished by: Relinquished by:	Date/Time:	Date:	ICom	nany .	Time		ceived	hv.	_	_		ethod of	Shipment: Date/Time:				Company	,	
(h)n	3/3//	9 154	5	Wood				(86	1			4-3	-19	F.	545	N		
Relinquished by:	Date/Time:	10	fao Com	ipany		Re	ceived	by	e e	Lee	0		Date/Time:	4/1	5	0/00	Company	,	
Relinquished by:	Date/Time:			pany		Re	ceired	by:					Date/Time:	,			Company	,	
Custody Seals Intact: Custody Seal No.:						Со	oler Te	empera	ature(s)	"C and Othe	r Remarks:		3.1	,-	# 1		-		
Δ Yes Δ No					-	L						_).		1		Ver: 01	16/2019	_

5/1/2019

Page 25 of 28

A Yes A No

TestAmerica Buffalo

10 Hazelwood Drive

Chain of Custody Record

TestAmerica

Amherst, NY 14228-2298 Phone (716) 691-2600 Fax (716) 691-7991	CERCE II	Ollaili	oi ous	iouy	110		'i u										THE LEADER	IN ENVIRON	MENTAL	TESTING
Client Information	Sampler:	LIZUSA	WA	N	ab PM Mason		ky C					Car	rier Tra	cking No(s	5);		COC No: 480-128049	-28918.1		
Client Contact: Mr. Brian Guichard	Phone: 978 - 1	427-5	682		E-Mail: becky.	maso	on@t	estar	meric	cainc.	com						Page: Page 1 of 1			
Company. Olin Corporation					T					An	alvsis	Requested					Job #:			
Address: 51 Eames street	STAN	ted:	,		1	7											Preservation	Codes:		
City: Wilmington	TAT Requested (TAT Requested (days):			1	2											A F 110000			
state, Zip: MA, 01887	STAN		2	ATOM CONTRACT																
Phone: 423-336-4012(Tel)	PO #: REWI0025				110	3														hydrate
email: peguichard@olin.com	WO#:			No (on	ite			9				480-15	1401 Ch	nain of	Custody					
Project Name: Quarterly GW	Project #: 48019903		N O	es or	s Sulfa	ionia	2	Conductance						contain	L - EDA		rt 4-5 her (spec	cify)		
OLIN WILMINGTON	SSOW#:		Samp	SD (Y	oride 8	, Amm	. Al, Cr							of cor	Other:					
Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)		oit, G	1	300.0_28D - Chi	350.1 - Nitrogen,	6010MCP - Diss.	2510B - Specific						Total Number	Speci	al Instruct	tions/N	lote:
20 000 0000	<u> </u>	\sim	Preserva	ation Cod	-	Y	N	S	D	N						X	-	_		
9C-GW-202S				Wate	-														-	
ac.gw.2020	111110	1000		Wate	-	,	V	V	V	V			-			. 1				
OC-GW-25	4/4/19	1145	G	Wate		4	Х	X	^	X	-	-		-	++-	4	-1		-	
OC.GW-78S	11.10			Wate	-1.			1					-			11				
OC-GW-79S	4/4/19			Wate	- 1	,	X	X	X	()			-		-	4				
OC-PZ-16RRR	4/4/19	0930	G	Wate	r Y	1	X	X	X	X			_		11	4	100			
OC-PZ-17RRR				Water		T														
OC-PZ-18R				Wate	-												•			
OC-PZ-24				Wate	-									_			4)			
OC-P7-25				Wate	-								-							
				Water	r															
Possible Hazard Identification Non-Hazard Flammable Skin Irritant Poi Deliverable Requested: I, II, III, IV, Other (specify)	son B Unkn	own ==	Radiological				\Box_{Re}	eturn	To	Client	Г	Dispo			les are i	1	ed longer th		th) onths	
Empty Kit Relinquished by:		Date:			TT	ime:	2000-01	1105.410		-			Meth	od of Ship	ment.				_	-
Relinquished by	Date/Time:	1510		Company	0	W. Was	Rece	ived 6	y:	1		, _	7		e/Time:	-	11-1-	Comp	any	
Relinquished by:	Date/Time:	1510	c.Fin	Company	Dav.	_	Rece	lived b	To the	P)	u	do	_	Date	04/0	17	15/0	20 Cerms		
Relinquished by:	Date/Time:		1800	Ompany			Rece	eved b		(C				Date	e/Time;	N//	1 40	Comp	any	
Custody Seals Intact: Custody Seal No.:							Coole	er Ten	nperat	lure(s)	"C and Ot	ner Rema	rks		2.2		#)			











Ver: 01/16/2019

Amherst, NY 14228-2298

10 Hazelwood Drive

360325-Boston

360325-Boston

Chain of Custody Record

360325-Boston

TestAmerica

The LEADER IN ENVIRONMENTAL TESTING

Phone (716) 691-2600 Fax (716) 691-7991																	7	HE LEADER IN EN	PRONMENTAL	TESTING
Client Information	SamplerChris	Marr	lin	Lab F Mas	PM: son, B	ecky	C					Can	Carrier Tracking No(s):					OC No: 80-128055-2892	0.1	
Client Contact: Mr. Brian Guichard	Phone: 3399	2737	96	E-Ma bec	ail: ky.ma	son(@test	amer	icaind	.com							Pa	ge: age 1 of 1		
Company: Olin Corporation									A	naly	sis F	eque	equested				Jo	b#:		
Address: 51 Eames street	Due Date Requeste	ed:						1					M				553	eservation Code		
City: Wilmington State, Zip:	TAT Requested (days): Standarl													1			В	- HCL - NaOH - Zn Acetate	M - Hexane N - None O - AsNaO2 P - Na2O4S	
MA, 01887 Phone:	PO #:									only				- 1			 		1100 11110 1101 110	
423-336-4012(Tel)	REWI0025				(9)					EHP o										
Email: beguichard@olin.com		WO #:				No)				and BEHP										
Project Name: Plant B Quarterly Q1 - Z019 Site: Dlin Wilmington MA	48019903					MS/MSD (Yes or No)	Ammonia		s only	NDPA				48	30-151	332 C	hain	of Custody		
Site: Olin Wilmington MA	SSOW#:	SSOW#:) dsi		VPH	TMP	8270							00 00	mer:		_
Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)		Field Filtered	Perform	350.1 - Nitrogen,	MAVPH - MA	8260MCP - 8260 TMPs	8270_LL_MCP - 8270 NDPA	9040C - pH						Total Number	Special In	structions/	Note:
	112/0	\geq	Preservation		X	XS	D	100	A	N	N						X			59年中世
OC-GW-16R	4/3/19	2280	6	Water	17/1	N	1	3	3	2	1	_		_	_		1)			
				Water	\coprod	-	1													
					1															
				/	Ш															
																Total Control				
					П															
	/	1	4/3/1	9	П						-									
	/2/	1/1/	7/2/		T			1												
	Th	. /			H	1														
	10				11	1		1												
	1				11	1	1	1		1										
Possible Hazard Identification					+	Sam	ple D	ispo	sal (4 fee	may	be ass	essed	if sam	ples a	re reta	inec	l longer than 1	month)	
Non-Hazard Flammable Skin Irritant Po	ison B Unk	nown	Radiological		-		Ret					Disp	osal B	y Lab		\Box A	rchiv	e For	Months	
							ciai in	struct	ions/	QC R	equire	ments:								
Empty Kit Relinquished by:	10.4.5	Date:			Tim				-				Meth		ipment:			-		
Relinquished by:	Date/Time: 4/3	19 15		company	1		Receive	ed by:	N	1	1				ate/Time	-15	ç	1385	Company	
Relinquished by:	Date/Time:	15	1800	company		F	Receive	d by	200	1	X	-	Date/Time: 04/04/19			9100	Camaday			
Relinquished by:	Date/Time:	1-1	10	Company	-	F	Receive	ed by:	-	V				Date/Time: Company						
Custody Seals Intact: Custody Seal No.:				7.7	-		Cooler	Tempe	erature(s) °C a	ind Oth	er Rema	rks:		46 -	2 1	1	n 1		All fire
Δ Yes Δ No						-									100 3	5.1		# 1		

Page 21 of 22

4/25/2019









Ver: 01/16/2019

10 Hazelwood Drive Amherst, NY 14228-2298

Phone (716) 691-2600 Fax (716) 691-7991

360325 Seaton

Chain of Custody Record

Lab PM:

360325-Boston

Carrier Tracking No(s):



CHRIS MAZZOLINI Mason, Becky C 480-128053-28919.1 Client Information Client Contact: Page: 339-927-3796 Mr. Brian Guichard becky.mason@testamericainc.com Page 1 of 1 Company: Job #: Analysis Dogusetad Olin Corporation Address: Due Date Requested: n Codes: 51 Eames street M - Hexane TAT Requested (days): N - None Wilmington STANDARD O - AsNaO2 P - Na204S State, Zip: Q - Na2SO3 MA. 01887 R - Na2S2O3 Phone: 2510B, 353.2, 353.2 Nitrite, Nitrate_Calc S-H2SO4 423-336-4012(Tel) REWI0025 T - TSP Dodecahydrate 1 - Ice U - Acetone WO# 300.0 28D - Sulfate and Chloride J - DI Water V - MCAA beguichard@olin.com Total Number of containers K - EDTA W - pH 4-5 Project Name Project #: L-EDA Z - other (specify) 15+ 2019 SW Quarterly 48019903 350.1 - Nitrogen, Ammo SSOW#: OLIN WILMINGTON 6010MCP - Diss. Sample Matrix Type (Wawater, Sasolid Sample (C=comp, O-waste/oil. Sample Identification Sample Date Time G=grab) BT#Tissue, A+Air) Special Instructions/Note: Preservation Code: D 5 4/2/19 2 OC-ISCO1 1410 9 Water 5 OC-ISCO2 1310 6 Water 5 1300 2 OC-ISCO3 6 Water 5 2 OC-PZ-16RRRSW 1330 G Water 5 Water 2 OC-PZ-17RRRSW 1340 5 OC-SD-18RSW 1405 Water 5 2 OC-SD-17 Water Water Possible Hazard Identification Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) Disposal By Lab Archive For Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological Return To Client Deliverable Requested: I, II, III, IV, Other (specify) Special Instructions/QC Requirements: Time: Method of Shipment Empty Kit Relinquished by: Company Relinquished by Wood

Company

Сотрапу

4/24/2019

Qustody Seal No.

Custody Seals Intact:

A Yes A No

Page 28 of 29

Cooler Temperature(s) "C and Other Remarks:





Company

Company

0100

#

Appendix C

Cap Inspection Log

	20 / 2010	Inonoctory	Temporary Cap Inspection Brian Guichard					
	29 / 2019	Inspector:	Brian Guichard					
Inspection Checklis	st							
Feature	Observati		Notes					
Drain	Clear and Functioning	Requires Maintenance	Date Cleared:					
Sewn Seams	Intact D	Requires Repairs	Date Repaired:					
Ballast	Intact D	Requires Replacement	Date Replaced:					
Panels	X Repair Locations		Date:					
Ballast Locations	O Locations Replace	d or Repaired	Wind damage AREAS					
Seam Locations	Locations Repaired	d	SEAM REPAIR/TEAR					

Note: Repairs done earlier in the season do not seem to be adhering to the cap surface sufficiently. Patches completed on the older sections of the cap do not stick because of the thread bare areas around the patch, and a few of the patches on the newer section of the cap do not seem to adhere to the newer cap material because it is thin and flimsy and not a smooth surface to bond to. Large sections in several areas of the cap have sustained damage from severe winter winds. Attempts will be made to pull back and re-ballast those sections where possible.

Appendix B

Data Validation Memoranda (*Provided on CD*)

Appendix B1-B2

Fourth Quarter 2018 Sampling Event First Quarter 2019 Sampling Event

Appendix B3

Additional Sampling Events
November 2018 Calcium Sulfate Landfill Sampling
December 2018 Private Well Sampling
March and April 2019 Private Well Sampling

Appendix B4

Unvalidated Data October 2018 – March 2019 Plant B RGP and Tank Sampling

Appendix C

Weir Monthly Inspection Reports: October 2018 – March 2019



Wood Environment & Infrastructure Solutions, Inc. 271 Mill Road, 3rd Floor Chelmsford, MA 01824 USA

October 26, 2018

T: 978-692-9090

www.woodplc.com

Wilmington Conservation Commission Town Hall 121 Glen Road Wilmington, MA 01887 Attn: Winifred McGowan

RE: Olin Corporation – DEP File #344-419 Weir Inspection Report – October 2018 Wood Project No. 6107-18-0016.04

Dear Commission:

This letter documents the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by Wood Environment & Infrastructure Solutions, Inc. (Wood) and Olin Corporation. The weekly weir inspection reports for the month of October 2018 are attached. Wood conducted an inspection on Friday, October 26, 2018.

West Ditch Off-Property

Stations A and B had a low level to normal level of clear water during all four inspections of the month. No flow and floating/submerged leaves were observed during the fourth and final inspection of the month.

Weir

Station D had a low level of clear water during the second and third inspections of the month. During the first and fourth inspection, Station D had a normal level and flow of clear water with floating and submerged leaves and a rust-orange color stream bottom (fourth inspection only).

There was a trickle flow to no flow from the Weir outlet and a no flow from the Plant B outlet during the first three inspections of the month. There was no flow from either outlet during the fourth inspection of the month. The main area was mostly clear with had a trickle flow to low flow of clear water during all four inspections.

South Ditch Downstream of the Weir

Stations E and F had a trickle flow of clear water during the first three inspections of the month. There was a low level and flow of clear water with floating and submerged leaves and a brown-rust stream bottom during the fourth and final inspection of the month. Station G had a trickle flow to very low flow of clear water during all four inspections of the month.

The hay bale line had a trickle flow to low level and flow of clear water during all four inspections of the month. A brown stream bottom was noted during the fourth inspection of the month.



Page 2

Wetland Areas South of the South Ditch

Stations H and I had some standing water and saturated soils during all four inspections of the month.

Sincerely,

Wood Environment & Infrastructure Solutions, Inc.

Chris Mazzolini

Senior Project Scientist

This Mantin

Michael J. Murphy Principal Scientist

An of Murphy

Attachments

cc: Mr. James Cashwell, Olin Corp. (Electronic)

Mr. Chinny Esakkiperumal, Olin Corp.

Mr. Brian Guichard, Olin Corp.

Mr. Jim DiLorenzo, EPA

Mr. Garry Waldeck, MassDEP - Boston

Wood Project File

[\\WFD-FS1\projectf\$\Projectf\$\Od_Wakefield_Data\projects\OLIN\Wilmington\South Ditch\Monthly Inspections\2018\2018-10\October 2018 Inspection.docx]

Date	10/4/2018	Time	9:30	Inspectors	Brian Guichard

	Precipitate							
Station	Obser	vation	Other Observations					
	Yes	No						
Offsite Fenced Ditch System			Stn A has a low level of clear water.					
Station A		х	Stn B has a normal level of clear water.					
Station B		×						
West Ditch Foot Bridge								
Station C		х	Filled in					
Weir - Upstream			Stn D has a normal level of clear water.					
Station D	х							
Weir - Downstream			Stations E & F have a trickle of clear water.					
Station E	×							
Station F	х							
Station G	х		Stn G has a trickle flow of clear water.					
Unnamed Ditch			Stn H has some stading water.					
Station H		х	Stn I has some standing water.					
Station I		Х						
Supplemental Inspection								
Locations (designate								
station location on page 2 of								
Staff Gauge Level								
Condition of Weir / Hay bale Barriers:			There is a trickle flow from the weir and no flow					
from the outlet pipe. The main area is	mostly cle	ear. The s	stream has a trickle flow of clear water.					
The walking trail is muddy and has mu	ltiple anin	nal trails	throughout.					
The Hay Bale line has a trickle flow.								

Date	10/12/2018	Time	11:30	Inspectors	Leroy Johnson	
------	------------	------	-------	------------	---------------	--

Station	EII .	pitate vation	Other Observations						
Gation	Yes	No							
Offsite Fenced Ditch System			Stn A has a low level of clear water.						
Station A		х	Stn B has a low level of clear water.						
Station B		х							
West Ditch Foot Bridge									
Station C		х	Filled in						
Weir - Upstream	Weir - Upstream		Stn D has a low level of clear water.						
Station D	х								
Weir - Downstream	<u> </u>		Stations E & F have a trickle of clear water.						
Station E	х								
Station F	х								
Station G	х		Stn G has a trickle flow of clear water.						
Unnamed Ditch			Stn H has saturated soil.						
Station H		х	Stn I has saturated soil.						
Station I		х							
Supplemental Inspection									
Locations (designate station location on page 2 of									
Staff Gauge Level									
			The size of the state of the st						
Condition of Weir / Hay bale Barriers:		_	There is no flow from the weir and no flow						
	mostly cle	ear. The s	stream has a trickle flow of clear water.						
The walking trail is less muddy.	<u>.</u>								
The Hay Bale line has a trickle flow.	The Hay Bale line has a trickle flow.								

Date	10/19/2018	Time	10:30	Inspectors	Leroy Johnson
------	------------	------	-------	------------	---------------

	Preci	pitate						
Station	II .	vation	Other Observations					
	Yes	No						
Offsite Fenced Ditch System			Stn A has a low level of clear water.					
Station A		х	Stn B has a low level of clear water.					
Station B		Х						
West Ditch Foot Bridge								
Station C		х	Filled in					
Weir - Upstream			Stn D has a low level of clear water.					
Station D	х							
Weir - Downstream			Stations E & F have a trickle of clear water.					
Station E	X							
Station F	х							
Station G	х		Stn G has a trickle flow of clear water.					
Unnamed Ditch			Stn H has some standing water.					
Station H		х	Stn I has saturated soil.					
Station I		х						
Supplemental Inspection								
Locations (designate station location on page 2 of								
Staff Gauge Level								
Condition of Weir / Hay bale Barriers:	<u> </u>		There is no flow from the weir and no flow					
from the outlet pipe. The main area is	mostly cla							
The walking trail is less muddy.		-ui. 1110 0	ness res a mone non or sour water.					
Vegetation is dying off for the winter se	ason	· ·						
vegetation is dying on for the witter se	,a3011.							
The Hay Bale line has a trickle flow.								
Moved some fallen branches from the stream around stations E & F.								

Olin Corporation

Wilmington Site Interim Action Plan

South and West Ditch Precipitate Inspection Report

Time: 8:30 Inspectors: Shawna lacozzi

	Station	Precip Obser		Other Observations
		Yes	No	
Off-site Fo	enced Ditch System			
	Station A		X	A: Low level of clear water, no flow, floating and submerged leaves
	Station B		X	B: Normal level of clear water, no flow, floating and submerged leaves
West Ditc	h Foot Bridge			
	Station C			C: Filled in
Weir - Ups	stream			
	Station D		X	D: Normal level of clear water w/ floating and submerged leaves and a rust
				orange bottom
Weir - Dov	wnstream			
	Station E		X	E & F: Low level and flow of clear water w/ a brown-rust bottom
	Station F		X	
	Station G		X	G: Very low flow of clear water
Unnamed	Ditch			

H: Saturated soil, some standing water

I: Standing water with saturated soil

Condition of Weir / Hay Bale Barriers:

Station H

Station I

Supplemental Inspection
Locations (designate station
location on page 2 of 2)
Staff Gauge Level

Date: 10/26/2018

~45°F

There was no flow from the Weir Outlet or from the Plant B Outlet.

The Main Area: Low level and flow of clear water, a brown-rust color was observed on the bottom.

Χ

Χ

The Hay Bale Line: Low level and flow of clear water w/ a brown bottom.

Leaves are falling and the vegetation is dying off due to colder temperatures.



Wood Environment & Infrastructure Solutions, Inc. 271 Mill Road, 3rd Floor Chelmsford, MA 01824 USA

T: 978-692-9090

www.woodplc.com

November 30, 2018

Wilmington Conservation Commission Town Hall 121 Glen Road Wilmington, MA 01887 Attn: Winifred McGowan

RE: Olin Corporation – DEP File #344-419 Weir Inspection Report – November 2018 Wood Project No. 6107-18-0016.04

Dear Commission:

This letter documents the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by Wood Environment & Infrastructure Solutions, Inc. (Wood) and Olin Corporation. The weekly weir inspection reports for the month of November 2018 are attached. Wood conducted an inspection on Friday, November 30, 2018.

West Ditch Off-Property

Stations A and B had a low to normal level of clear water for the first four inspections of the month and a medium level of clear water with submerged leaves during the fifth and final inspection of the month.

Weir

Station D had a normal to low level of clear water during the first four inspections of the month. For the fifth inspection, Station D had a medium level and flow of clear water with floating leaves and a brown stream bottom.

During the first four inspections of the month there was no flow from the weir and low flow from the Plant B outlet pipe. During the fifth and final inspection, there was moderate to low flow and level of clear water from the weir and Plant B outlets. The Main Area was mostly clear with low flow to a trickle flow of clear water during the first four inspections of the month. During the fifth inspection, the Main Area had a medium to low level and flow of clear to slightly tannic water; with floating and submerged leaves; and a brown stream bottom.

South Ditch Downstream of the Weir

Stations E and F had a low to trickle flow of clear water during the first four inspections of the month. During the fifth inspection, a medium to high level and flow of clear water with some foaming was observed along with submerged leaves and a brown stream bottom. Station G had a low flow to trickle flow of clear water during the first four inspections of the month. During the fifth and final inspection of the month, Station G had a medium level and flow of clear water with some foaming; and a brown stream bottom.



Page 2

The hay bale line had a trickle flow of clear water during the first four inspections of the month. A low level and flow of clear water; a brown stream bottom; and some slight foaming was observed during the fifth and final inspection of the month.

Wetland Areas South of the South Ditch

Stations H and I were observed flooded with standing water during the first, third, fourth, and fifth inspections of the month. Stations H and I were observed as dry with saturated soils during the second inspection of the month.

Sincerely,

Wood Environment & Infrastructure Solutions, Inc.

Chris Mazzolini

Senior Project Scientist

Chris Planolin

Michael J. Murphy Principal Scientist

An of Murphy

Attachments

cc: Mr. James Cashwell, Olin Corp. (Electronic)

Mr. Chinny Esakkiperumal, Olin Corp.

Mr. Brian Guichard, Olin Corp.

Mr. Jim DiLorenzo, EPA

Mr. Garry Waldeck, MassDEP - Boston

Wood Project File

Date	11/2/2018	Time	9:30	Inspectors	Leroy Johnson
				· -	

Station Precipitate Observation Yes No							
		Obser	vation	Other Observations			
		Yes	No				
Offsite Fen	ced Ditch System			Stn A has a low level of clear water.			
	Station A		х	Stn B has a normal level of clear water.			
	Station B		х				
West Ditch	Foot Bridge						
	Station C		х	Filled in			
Weir - Upst	ream			Stn D has a normal level of clear water.			
	Station D	Х					
Weir - Dow	nstream			Stations E & F have a low of clear water.			
	Station E	х					
	Station F	х					
e e e e e e e e e e e e e e e e e e e	Station G	х		Stn G has a low flow of clear water.			
Unnamed D	itch			Stn H has standing water.			
	Station H		х	Stn I has standing water.			
	Station I		х				
	tal Inspection						
Locations							
	tion on page 2 of						
Staff Gauge	Level						
Condition of W	eir / Hay bale Barriers:			There is no flow from the weir and a low flow			
from the outlet	pipe. The main area is r	nostly cle	ar. The s	tream has a low flow of clear water.			
The walking tra	il is muddy.						
Vegetation is m	nostly dead for the winte	r season.					
The Hey Dele II	The Head Balls Construction of the Constructio						
THE HAY DAILE I	ne has a trickle flow.						
							
							

Date	11/9/2018	Time	9:30	Inspectors	Brian Guichard
				-	

	Precipitate				
Station	Obser	vation	Other Observations		
	Yes No				
Offsite Fenced Ditch System			Stn A has a low level of clear water.		
Station A		х	Stn B has a low level of clear water.		
Station B		х			
West Ditch Foot Bridge					
Station C		х	Filled in		
Weir - Upstream			Stn D has a low level of clear water.		
Station D	х				
Weir - Downstream			Stations E & F have a trickle of clear water.		
Station E	х				
Station F	х				
Station G	х		Stn G has a trickle flow of clear water.		
Unnamed Ditch			Stn H has saturated soil.		
Station H		x	Stn I has saturated soil.		
Station I		х			
Supplemental Inspection					
Locations (designate					
station location on page 2 of					
Staff Gauge Level		<u> </u>			
Condition of Weir / Hay bale Barriers:			There is no flow from the weir and no flow		
from the outlet pipe. The main area is	mostly cle	ear. The s	stream has a trickle flow of clear water.		
The Hay Bale line has a trickle flow.					
	- - , -				

Date 11	/16/2018 Time	1:00	Inspectors	Leroy Johnson	
---------	---------------	------	------------	---------------	--

	Precipitate				
Station		vation	Other Observations		
		No			
Offsite Fenced Ditch System			Stn A has a low level of clear water.		
Station A		х	Stn B has a normal level of clear water.		
Station B		х			
West Ditch Foot Bridge					
Station C		х	Filled in		
Weir - Upstream			Stn D has a normal level of clear water.		
Station D	Х				
Weir - Downstream			Stations E & F have a low of clear water.		
Station E	х				
Station F	х				
Station G	х		Stn G has a low flow of clear water.		
Unnamed Ditch			Stn H has standing water.		
Station H		х	Stn I has standing water.		
Station I		Х			
Supplemental Inspection					
Locations (designate					
station location on page 2 of					
Staff Gauge Level					
Condition of Weir / Hay bale Barriers:			There is no flow from the weir and a low flow		
from the outlet pipe. The main area is	mostly cle	ear. The s	stream has a low flow of clear water.		
The walking trail is muddy with coyote	and deer	prints in t	the mud.		
Vegetation is mostly dead for the winte	rseason				
The Hay Bale line has a trickle flow.					
Remove some fallen branches from the	e trail nea	ar the foot	t bridge.		
The state of the s					

11/21/2018	10:00	Inspectors	Leroy Johnson

Station	K	pitate vation	Other Observations				
	Yes No						
Offsite Fenced Ditch System			Stn A has a low level of clear water.				
Station A		х	Stn B has a normal level of clear water.				
Station B		х					
West Ditch Foot Bridge							
Station C		X	Filled in				
Weir - Upstream			Stn D has a normal level of clear water.				
Station D	х						
Weir - Downstream			Stations E & F have a low of clear water.				
Station E	х						
Station F	х						
Station G	х		Stn G has a low flow of clear water.				
Unnamed Ditch			Stn H has standing water.				
Station H		х	Stn I has standing water.				
Station I		х					
Supplemental Inspection							
Locations (designate							
station location on page 2 of							
Staff Gauge Level							
Condition of Weir / Hay bale Barriers:			There is no flow from the weir and a low flow				
from the outlet pipe. The main area is	mostly cle	ear. The s	stream has a low flow of clear water.				
The walking trail is frozen mud. Saw 3	deer nea	r the foot	bridge.				
Vegetation is dead for the winter season.							
The Hay Bale line has a trickle flow.	The Hay Bale line has a trickle flow.						
	· · · · · · · · · · · · · · · · · · ·						

Wilmington Site Interim Action Plan

South and West Ditch Precipitate Inspection Report

Date: 11/30/2018	Time:	11:15	Inspectors: S. Iacozzi	
~55°F; Partly cloudy				

	Б.				
a	Precipitate Observation				
Station			Other Observations		
Yes		No			
Off-site Fenced Ditch System	1	I			
Station A		Х	A: Med level of clear water w/ submerged leaves		
Station B		Х	B: Med level of clear water w/ submerged leaves		
West Ditch Foot Bridge	1	ı			
Station C			C: Filled in		
Weir - Upstream		ı			
Station D		Х	D: Med. level and flow of clear water w/		
			floating leaves and a brown color observed on the bottom		
Weir - Downstream	_				
Station E		Х	E and F: Med. to high level and flow of clear water;		
Station F		Х	w/ submerged leaves and a brown color on the bottom; foam observed		
Station G		Х	G: Med. level and flow of clear water w/ brown stream bottom; foaming		
			observed		
Unnamed Ditch					
Station H		х	H: Flooded		
Station I		Х	I: Flooded		
Supplemental Inspection					
Locations (designate station					
location on page 2 of 2)					
Staff Gauge Level					
Condition of Weir / Hay Bale Barriers:					
There was a moderate level and flow of c	lear water fr	om the Plai	nt B outlet and a low level and flow from the Weir Outlet pipe.		
The Main Area: Low to medium level and	flow of clea	r to slightly	tannic water; w/ a brown bottom w/ floating/submerged leaves observed.		
The Hay Bale Line: Low level and flow of	stream bottom and leaves observed; slight foaming noted.				



Wood Environment & Infrastructure Solutions, Inc. 271 Mill Road, 3rd Floor Chelmsford, MA 01824 USA

T: 978-692-9090

www.woodplc.com

December 27, 2018

Wilmington Conservation Commission Town Hall 121 Glen Road Wilmington, MA 01887 Attn: Winifred McGowan

RE: Olin Corporation – DEP File #344-419 Weir Inspection Report – December 2018 Wood Project No. 6107-18-0016.04

Dear Commission:

This letter documents the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by Wood Environment & Infrastructure Solutions, Inc. (Wood) and Olin Corporation. The weekly weir inspection reports for the month of December 2018 are attached. Wood conducted an inspection on Wednesday, December 27, 2018.

West Ditch Off-Property

During all four inspection Stations A and B had a high to normal level of clear water.

Weir

Station D had a high level to normal level of clear water during the first three inspections of the month. During the fourth and final inspection, Station D had medium level and low flow of clear water that was partially frozen; a brown stream bottom was also observed.

There was high flow to trickle flow from the Weir outlet; and moderate to low flow from the Plant B outlet during the first three inspections of the month. During the final inspection of the month, there was a moderate level and flow of clear water from the Weir and no flow from the Plant B outlet. The Main Area was mostly clear with a high to low flow of clear water during the first three inspections. For the fourth inspection, the area was partially frozen, with a low to medium flow of clear to tannic water.

South Ditch Downstream of the Weir

Stations E and F had a high to low flow of clear water, during the first three inspections of the month. During the fourth inspection, Stations E and F had a medium level and flow of clear water with submerged leaves noted and areas of foaming. Station G had a high to low flow of clear water during the first three inspections of the month. During the fourth inspection, Station G had a medium level and flow of clear water, with some foaming noted along with areas that were partially frozen.



Page 2

The hay bale line had a high to low flow of clear water observed during the first three inspections. A low to medium level and flow of clear water, brown stream bottom, submerged leaves, and slight foaming were observed during the fourth and final inspection of the month.

Wetland Areas South of the South Ditch

Stations H and I had standing water for the first three inspections of the month. For the four and final inspection, Stations H and I were flooded and partially frozen.

Sincerely,

Wood Environment & Infrastructure Solutions, Inc.

Chris Mazzolini

Senior Project Scientist

Chris Plantin

Michael J. Murphy Principal Scientist

An of Murphy

Attachments

cc: Mr. James Cashwell, Olin Corp. (Electronic)

Mr. Chinny Esakkiperumal, Olin Corp.

Mr. Brian Guichard, Olin Corp.

Mr. Jim DiLorenzo, EPA

Mr. Garry Waldeck, MassDEP - Boston

Wood Project File

[\WFD-FS1\projects\old_Wakefield_Data\projects\OLIN\Wilmington\South Ditch\Monthly Inspections\2018\2018-12\December 2018 Inspection.docx]

Date	12/7/2018	Time	9:00	Inspectors	Leroy Johnson	
------	-----------	------	------	------------	---------------	--

Station		ipitate			
Station		rvation	Other Observations		
Offsite Fenced Ditch System		No			
		Т	Stn A has a high level of clear water.		
Station A		X	Stn B has a high level of clear water.		
Station B		x			
West Ditch Foot Bridge					
Station C		х	Filled in		
Weir - Upstream			Stn D has a high level of clear water.		
Station D	х				
Weir - Downstream			Stations E & F have a high flow of clear water.		
Station E	х		The arrigin new of clear water.		
Station F	х				
Station G	X		Stn G has a high flow of clear water.		
Unnamed Ditch			Stn H has standing water.		
Station H		х	Stn I has standing water.		
Station I		х	our rido startumy water.		
Supplemental Inspection					
Locations (designate					
station location on page 2 of					
Staff Gauge Level					
Condition of Weir / Hay bale Barriers:			There is a high flow from the weir and a moderate flow		
from the outlet pipe. The main area is m	ostly cle	ar. The st	ream has a high flow of clear water.		
The walking trail is muddy.					
The Hay Bale line has a high flow of clear	The Hay Bale line has a high flow of clear water.				
	ai water.				
					

Date	12/14/2018	Time _	9:00	Inspectors	Brian Guichard
------	------------	--------	------	------------	----------------

Station		ipitate				
Station		rvation	Other Observations			
Official Formed Bit 1.0	Yes	No				
Offsite Fenced Ditch System			Stn A has a normal level of clear water.			
Station A		х	Stn B has a normal level of clear water.			
Station B		х				
West Ditch Foot Bridge						
Station C		х	Filled in			
Weir - Upstream			Stn D has a normal level of clear water.			
Station D	х		out of has a normal level of clear water.			
Weir - Downstream	1		Stations F.O.F.			
Station E	х		Stations E & F have a medium flow of clear water.			
Station F	x					
Station G	X		Chr. O.L.			
Unnamed Ditch			Stn G has a medium flow of clear water.			
Station H			Stn H has standing water.			
Station		Х	Stn I has standing water.			
Supplemental Inspection		Х				
Locations (designate						
station location on page 2 of						
Staff Gauge Level						
Condition of Weir / Hay bale Barriers:		T	horo io e leu fleu f			
	ostly olo		here is a low flow from the weir and a low flow			
from the outlet pipe. The main area is mostly clear. The stream has a medium flow of clear water. The walking trail is muddy.						
Hanning wan to Huddy.						
The Hay Bale line has a medium flow of clear water.						

Date	12/20/2018	Time	9:00	Inspectors	Brian Guichard
------	------------	------	------	------------	----------------

Station		ipitate	Other Observations		
Station		rvation			
	Yes	No			
Offsite Fenced Ditch System			Stn A has a normal level of clear water.		
Station A		х	Stn B has a normal level of clear water.		
Station B		х			
West Ditch Foot Bridge					
Station C		х	Filled in		
Weir - Upstream			Stn D has a normal level of clear water.		
Station D	x		The state of order water.		
Weir - Downstream			Stations E & F have a low flow of clear water.		
Station E	х		The a low flow of clear water.		
Station F	х				
Station G	х		Stn G has a low flow of clear water.		
Unnamed Ditch			The crown low of cical water.		
Station H		х	Stn H has some standing water.		
Station I		х	Stn I has standing water.		
Supplemental Inspection			The state of the s		
Locations (designate					
station location on page 2 of					
Staff Gauge Level					
Condition of Weir / Hay bale Barriers:		_1	There is a trickle flow from the weir and a low flow		
from the outlet pipe. The main area is m	ostly cle	ar. The st	ream has a low flow of clear water		
The walking trail is still muddy but a bit better than last week.					
The Hay Bale line has a low flow of clear water.					
The same state of the first water.					
		 -			

Olin Corporation

Wilmington Site Interim Action Plan

South and West Ditch Precipitate Inspection Report

 Date:
 12/27/2018
 Time:
 8:15
 Inspectors:
 S. lacozzi

 ~30 °F; Partly sunny
 S. lacozzi

3.	Precipitate		Other Observations				
Station	Observation						
	Yes No						
Off-site Fenced Ditch System							
Station A		Х	A: Normal level of clear water w/ submerged leaves				
Station B		Х	B: Normal level of clear water w/ submerged leaves				
West Ditch Foot Bridge							
Station C			C: Filled in				
Weir - Upstream							
Station D		х	D: Med. level and low flow of clear water that was partially frozen in areas				
			with less flow; a brown color stream bottom was observed				
Weir - Downstream							
Station E		Х	E and F: Med. level and flow of clear water; w/ submerged leaves and				
Station F		Х	a brown color on the bottom; slight foaming observed				
Station G	х		G: Med level & flow of clear water w/ brown stream bottom; slight foaming				
			observed; areas with less flow were partially frozen				
Unnamed Ditch							
Station H		Х	H: Flooded and partially frozen				
Station I		Х	I: Flooded and partially frozen				
Supplemental Inspection							
Locations (designate station							
location on page 2 of 2)							
Staff Gauge Level							
Condition of Weir / Hay Bale Barriers:							
There was a moderate level and flow of c	lear water fr	om the We	ir outlet and no flow from the Plant B Outlet pipe.				
The Main Area: Low to medium level and flow of clear to slightly tannic water; w/ a brown bottom w/ submerged leaves observed.							
Some parts of the main area were partially frozen.							
The Hay Bale Line: Low to med. level and flow of clear water; w/ a brown stream bottom and leaves observed; slight foaming noted.							



Wood Environment & Infrastructure Solutions, Inc. 271 Mill Road, 3rd Floor Chelmsford, MA 01824 USA

T: 978-692-9090

www.woodplc.com

January 24, 2019

Wilmington Conservation Commission Town Hall 121 Glen Road Wilmington, MA 01887 Attn: Winifred McGowan

RE: Olin Corporation – DEP File #344-419 Weir Inspection Report – January 2019 Wood Project No. 6107-19-0016.04

Dear Commission:

This letter documents the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by Wood Environment & Infrastructure Solutions, Inc. (Wood) and Olin Corporation. The weekly weir inspection reports for the month of January 2019 are attached. Wood conducted an inspection on Wednesday, January 24, 2019.

West Ditch Off-Property

Stations A and B had a normal level of clear water during the first three inspections of the month. For the fourth inspection, Stations A and B has a high level of clear water.

Weir

Station D had a normal level of clear water during the first three inspections of the month. During the fourth and final inspection, Station D had high level of clear water.

There was trickle flow from the Weir outlet; and no flow from the Plant B outlet during the first three inspections of the month. During the final inspection of the month, there was a moderate to high level and flow of clear water from the Weir and Plant B outlets. The Main Area was mostly clear with a trickle flow of clear water and partially ice covered during the first three inspections. For the fourth inspection, the area was mostly clear and had a high flow of clear water.

South Ditch Downstream of the Weir

Stations E and F had a trickle flow of clear water during the first three inspections of the month. During the fourth inspection, Stations E and F had a moderate to high flow of clear water. Station G had a trickle flow of clear water during the first three inspections of the month. During the fourth inspection, Station G had a moderate to high flow of clear water.

The hay bale line had a trickle flow of clear water during the first three inspections. A high flow of clear water was observed during the fourth and final inspection of the month.



Wetland Areas South of the South Ditch

Stations H and I had some standing water that froze into ice during the first three inspections of the month. For the four and final inspection, Stations H and I were snow covered.

Sincerely,

Wood Environment & Infrastructure Solutions, Inc.

Chris Mazzolini

Senior Project Scientist

This Plantin

Michael J. Murphy Principal Scientist

An of Murphy

Attachments

cc: Mr. James Cashwell, Olin Corp. (Electronic)

Mr. Chinny Esakkiperumal, Olin Corp.

Mr. Brian Guichard, Olin Corp.

Mr. Jim DiLorenzo, EPA

Mr. Garry Waldeck, MassDEP - Boston

Wood Project File

Date	1/4/2019	Time	9:00		Brian Guichard
------	----------	------	------	--	----------------

Station	11	pitate				
Guadon	Observation Yes No		Other Observations			
Offsite Fenced Ditch System	163	140	Stn A has a normal level of clear water.			
Station A		х	Stn B has a normal level of clear water.			
Station B		X	our bridg a normal level of clear water.			
West Ditch Foot Bridge	<u> </u>					
Station C		х	Filled in			
Weir - Upstream			Stn D has a normal level of clear water.			
Station D	х		The second secon			
Weir - Downstream			Stations E & F have a trickle flow of clear water.			
Station E	х					
Station F	х					
Station G	х		Stn G has a trickle flow of clear water.			
Unnamed Ditch						
Station H		х	Stn H has some standing water.			
Station I		Х	Stn I has standing water.			
Supplemental Inspection						
Locations (designate station location on page 2 of						
Staff Gauge Level						
Condition of Weir / Hay bale Barriers:			There is a trickle flow from the weir and no flow			
	nostly cle	_				
from the outlet pipe. The main area is mostly clear. The stream has a trickle flow of clear water.						
The Hay Bale line has a trickle flow of clear water.						
The second control of clear water.						

Date1/11	/2019 Time	8:00	Inspectors	Brian Guichard
----------	------------	------	------------	----------------

Station		Precipitate						
			vation	Other Observations				
000		Yes	No					
Offsite Fend	ced Ditch System			Stn A has a normal level of clear water.				
	Station A		х	Stn B has a normal level of clear water.				
	Station B		х					
West Ditch	Foot Bridge							
	Station C		х	Filled in				
Weir - Upstr	ream			Stn D has a normal level of clear water.				
	Station D	х						
Weir - Dowr	stream			Stations E & F have a trickle flow of clear water.				
	Station E	х		and a make now or oldar water.				
	Station F	х						
	Station G	х		Stn G has a trickle flow of clear water.				
Unnamed D	itch							
	Station H		х	Stn H has some frozen standing water.				
	Station I		x	Stn I has some frozen standing water.				
Supplement	al Inspection							
Locations (designate		1						
	tion on page 2 of							
Staff Gauge	Level							
Condition of We	ir / Hay bale Barriers:		-	There is a trickle flow from the weir and no flow				
from the outlet p	from the outlet pipe. The main area is mostly clear and partially ice covered. The stream has a trickle flow of							
clear water and has ice cover along the stream banks.								
The Hay Bale lin								
	The Hay Bale line has a trickle flow of clear water.							
				H				

Date	1/18/2019	Time	9:30	Inspectors	Brian Guichard
------	-----------	------	------	------------	----------------

Station		ipitate				
Station		rvation	Other Observations			
Officito Formand Ditate On the	Yes	No				
Offsite Fenced Ditch System			Stn A has a normal level and partially ice covered.			
Station A		x	Stn B has a normal level and partially ice covered.			
Station B		х				
West Ditch Foot Bridge						
Station C		х	Filled in			
Weir - Upstream			Stn D has a normal level of clear water.			
Station D	х		The state of the s			
Weir - Downstream			Stations E & F have a trickle flow of clear water.			
Station E	х		The state of the s			
Station F	х					
Station G	х		Stn G has a trickle flow of clear water.			
Unnamed Ditch						
Station H		х	Stn H has some ice.			
Station I		х	Stn I has some ice.			
Supplemental Inspection						
Locations (designate						
station location on page 2 of						
Staff Gauge Level						
Condition of Weir / Hay bale Barriers:			There is a trickle flow from the weir and no flow			
from the outlet pipe. The main area is m	ostly cle	ar and pa	rtially ice covered. The stream has a trickle flow of			
clear water and has ice cover along the stream banks.						
The Hay Bale line has a trickle flow of clear water.						

Wilmington Site Interim Action Plan

South and West Ditch Precipitate Inspection Report

	~45°F; Rain			
Date:	1/24/2019	Time:	11:30	Inspectors: Shawna lacozzi

Station		ecipitate servation No	Other Observations
Off-site Fenced Ditch System	163	140	
Station A		Х	A: High level of clear water
Station B		Х	B: High level of clear water
West Ditch Foot Bridge	•	T	
Station C			C: Filled in
Weir - Upstream		T	
Station D		Х	D: High level of clear water
Weir - Downstream	Т	T	
Station E		Х	E: Moderate to high flow of clear water
Station F		Х	F: Moderate to high flow of clear water
Station G		Х	G: Moderate to high flow of clear water
Unnamed Ditch	T	Τ	
Station H		Х	H: Snow covered
Station I		Х	I: Snow covered
Supplemental Inspection			
Locations (designate station			
location on page 2 of 2)			<u> </u>
Staff Gauge Level			
Condition of Weir / Hay Bale Barriers:			
There was a moderate to high level and f			• •
The Main Area: Mostly clear. The stream		flow of clear wate	r, and the walking trail is snow covered.
The Hay Bale Line: High flow of clear wat	er.		



Wood Environment & Infrastructure Solutions, Inc. 271 Mill Road, 3rd Floor Chelmsford, MA 01824 USA

T: 978-692-9090

www.woodplc.com

February 22, 2019

Wilmington Conservation Commission Town Hall 121 Glen Road Wilmington, MA 01887 Attn: Winifred McGowan

RE: Olin Corporation – DEP File #344-419 Weir Inspection Report – February 2019 Wood Project No. 6107-19-0016.04

Dear Commission:

This letter documents the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by Wood Environment & Infrastructure Solutions, Inc. (Wood) and Olin Corporation. The weekly weir inspection reports for the month of February 2019 are attached. Wood conducted an inspection on Friday, February 22, 2019.

West Ditch Off-Property

During all four of the inspections, Stations A and B had a low to normal levels of clear water and were partially covered by ice.

Weir

During all four of the inspections, Station D had a normal level of clear water. For the first and fourth inspection, some ice was noted. During the fourth and final inspection, submerged leaves and a brown-rust stream bottom were noted.

During the first three inspections, there was a trickle flow from the Weir outlet. During the first and second inspections, there was no flow from the Plant B outlet pipe. During the third inspection there was a trickle flow of clear water from the Plant B outlet. For the fourth and final inspection, there was a low level and flow of clear water from the Weir and Plant B outlets. During the first three inspections, the Main Area was mostly clear, partially ice covered with a trickle of clear water with ice along the stream banks. During the fourth inspection, the Main Area had a low to medium level and flow of clear water with submerged leaves; an orange-rust color was observed on the stream bottom; along with some floating ice.

South Ditch Downstream of the Weir

Stations E and F had a trickle flow of clear water during the first three inspections of the month. During the fourth inspection, Stations E and F had a medium level and flow of clear water with a brown stream bottom and ice noted along the banks. Station G had a trickle flow of clear water during the first three inspections of the month. During the fourth inspection of the month, Station G had a low level and flow of clear water with a brown stream bottom.



Page 2

The hay bale line had a trickle flow of clear water during the first three inspections of the month. A low level and flow of clear water, a rust color stream bottom, and ice along the banks was observed during the fourth and final inspection of the month.

Wetland Areas South of the South Ditch

Stations H and I were iced over during the first three inspections of the month. During the fourth inspection, Stations H & I were snow covered.

Sincerely,

Wood Environment & Infrastructure Solutions, Inc.

Chris Mazzolini

Senior Project Scientist

This Plantin

Michael J. Murphy

Principal Scientist

An of Murphy

Attachments

cc: Mr. James Cashwell, Olin Corp. (Electronic)

Mr. Chinny Esakkiperumal, Olin Corp.

Mr. Brian Guichard, Olin Corp.

Mr. Jim DiLorenzo, EPA

Mr. Garry Waldeck, MassDEP - Boston

Wood Project File

 $[\WFD-FS1\projects\old_Wakefield_Data\projects\oln\withington\south\displays Ditch\wonthly\ Inspections\south\south\displays Ditch\wonthly\displays Ditch\wont$

Date	2/1/2019	Time	10:30	Inspectors	Brian Guichard

		<u> </u>			
	Precipitate				
Station		vation	Other Observations		
	Yes No				
Offsite Fenced Ditch System			Stn A has a normal level and partially ice covered.		
Station A		х	Stn B has a normal level and partially ice covered.		
Station B		Х			
West Ditch Foot Bridge					
Station C		х	Filled in		
Weir - Upstream			Stn D has a normal level of clear water.		
Station D	х				
Weir - Downstream			Stations E & F have a trickle flow of clear water.		
Station E	х				
Station F	х				
Station G	х		Stn G has a trickle flow of clear water.		
Unnamed Ditch					
Station H		х	Stn H has some ice.		
Station I		Х	Stn I has some ice.		
Supplemental Inspection					
Locations (designate					
station location on page 2 of					
Staff Gauge Level					
Condition of Weir / Hay bale Barriers:			There is a trickle flow from the weir and no flow		
from the outlet pipe. The main area is	mostly cl	ear and p	partially ice covered. The stream has a trickle flow of		
clear water and has ice cover along th	e stream	banks.			
The Hay Bale line has no flow.					
The rist sale in a feet in feet.					
					

Date	2/8/2019	Time	8:30	Inspectors	Brian Guichard
				•	

Preci	pitate		
Obser	vation	Other Observations	
Yes No			
		Stn A has a normal level and is ice covered.	
	х	Stn B has a normal level and is ice covered.	
	х		
	X	Filled in	
		Stn D has a normal level and ice covered.	
х			
		Stations E & F have a trickle flow of clear water.	
х			
х			
х		Stn G has a trickle flow of clear water.	
	х	Stn H has ice.	
	х	Stn I has ice.	
	<u></u>		
		There is a trickle flow from the weir and no flow	
moetly ice	a covered	I. The stream has a trickle flow of	
		. The stream has a tronce now or	
e sucam	Dariks.		
	· · · · · · · · · · · · · · · · · · ·		
·			
	X X X X X X X X X X X X X X X X X X X	X	

Date	2/15/2019	Time	8:30	Inspectors	Brian Guichard
------	-----------	------	------	------------	----------------

Station		Precipitate		Other Ohearstians
		Obser		Other Observations
05:4-5	I Ditala Caratana	Yes	No	
	Ditch System			Stn A has a normal level and partly ice covered.
	ation A		Х	Stn B has a normal level and is partly ice covered.
	ation B		Х	
West Ditch Fo	ot Bridge			
St	ation C		Х	Filled in
Weir - Upstrea	ım			Stn D has a normal level of clear water.
St	ation D	х		
Weir - Downst	ream			Stations E & F have a trickle flow of clear water.
St	tation E	X		
St	tation F	х		
St	tation G	х		Stn G has a trickle flow of clear water.
Unnamed Ditc	h			
St	tation H		х	Stn H has some ice.
	tation I		х	Stn I has some ice.
Supplemental	•			
	esignate on on page 2 of			
Staff Gauge L				
	/ Hay bale Barriers:	J		There is a trickle flow from the weir and a trickle flow
	•	partly ice	covered.	The stream has a trickle flow of
	as ice cover along the	·		
oldar Water arra ric	20 100 00 vo. G.o.i.g u.			
			·	
The Hay Bale line has a trickle flow.				
i				

Olin Corporation

Wilmington Site Interim Action Plan

South and West Ditch Precipitate Inspection Report

 Date:
 2/22/2019
 Time:
 9:15
 Inspectors:
 Shawna lacozzi

 ~35°F; Sunny
 -35°F; Sunny

		pitate	
Station	Observation		Other Observations
	Yes	No	
Off-site Fenced Ditch System	1		
Station A		Х	A: Normal level of clear water, partially frozen along banks
Station B		Х	B: Normal level of clear water, partially frozen along banks
West Ditch Foot Bridge			
Station C			C: Filled in
Weir - Upstream			
Station D		х	D: Med. level and flow of clear water w/ leaves and a brown-rust bottom;
			some ice noted
Weir - Downstream			
Station E		х	E&F: Med. level & flow of clear water w/ and a brown stream bottom; partially
Station F		х	frozen along the banks
Station G		х	G: Low level and flow of clear water w/ brown stream bottom
State of Sta			
Unnamed Ditch			
Station H		х	H: Snow covered
Station I		X	I: Snow covered
Supplemental Inspection			
Locations (designate station			
location on page 2 of 2)			
Staff Gauge Level			
	<u> </u>		1
Condition of Weir / Hay Bale Barriers:		DI 180	## DW : O ## :
There was a low level and flow of clear wa			• •
			erged leaves and an orange-rust color were observed on the bottom. Some floating ice.
The Hay Bale Line: Low level and flow of	clear water	w/ rust botte	om, partially frozen along the banks.
The walking path was snow covered. Two	white tail d	leer were se	een near the foot bridge.



Wood Environment & Infrastructure Solutions, Inc. 271 Mill Road, 3rd Floor Chelmsford, MA 01824 USA

T: 978-692-9090

www.woodplc.com

Wilmington Conservation Commission Town Hall 121 Glen Road

Wilmington, MA 01887 Attn: Winifred McGowan

March 29, 2019

RE: Olin Corporation – DEP File #344-419 Weir Inspection Report – March 2019 Wood Project No. 6107-19-0016.04

Dear Commission:

This letter documents the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by Wood Environment & Infrastructure Solutions, Inc. (Wood) and Olin Corporation. The weekly weir inspection reports for the month of March 2019 are attached. Wood conducted an inspection on Friday, March 29, 2019.

West Ditch Off-Property

Stations A and B had a normal level of clear water during the first inspection. During the second and third inspections, both Stations A and B were covered in snow. For the fourth and fifth inspections of the month, Stations A and B had a medium to high level and medium to low flow of clear water.

Weir

Station D had a normal level of clear water during the first inspection and was covered with snow during the second and third inspections of the month. A high level and medium flow of clear water was observed during the fourth and fifth inspections of the month.

There was a trickle flow from the Weir outlet and no flow from the Plant B outlet during the first three inspections. During the fourth and fifth inspection, there was a medium/ moderate level and flow of clear water from the Weir outlet and Plant B outlet. The Main Area was partially covered with ice during the first inspection and was snow covered for the second and third inspections of the month. During the fourth and fifth inspection, the Main Area had a high level and flow of clear water with some floating algae noted during the final inspection.

South Ditch Downstream of the Weir

Stations E and F had a trickle flow to moderate flow of clear water for the first four inspections of the month. For the fifth and final inspection, Stations E and F had a moderate level and flow of clear water with algae growth. Station G was covered with snow during the first three inspections of the month. Station G has a moderate level and medium flow of clear water during the fourth and fifth inspection of the month. Algae growth was observed during the fifth and final inspection of the month.







Page 2

The hay bale line had a trickle flow of clear water during the first inspection of the month and was covered with snow during the second and third inspections of the month. A moderate level and flow of clear water and a rust color stream bottom was observed during the fourth and fifth inspection of the month.

Wetland Areas South of the South Ditch

Stations H and I were covered in snow and ice during the first three inspections of the month. During the fourth and fifth inspections, both Stations H and I were flooded and had saturated soils.

Sincerely,

Wood Environment & Infrastructure Solutions, Inc.

Chris Mazzolini

Senior Project Scientist

This Plantin

Michael J. Murphy Principal Scientist

Am of Murphy

Attachments

cc: Mr. James Cashwell, Olin Corp. (Electronic)

Mr. Chinny Esakkiperumal, Olin Corp.

Mr. Brian Guichard, Olin Corp.

Mr. Jim DiLorenzo, EPA

Mr. Garry Waldeck, MassDEP - Boston

Wood Project File

Date3/1/2019 Time11:30 Inspectors _B	Brian Guichard
--------------------------------------	----------------

Station		pitate vation No	Other Observations			
Offsite Fenced Ditch System	1	1.00	Stn A has a normal level and partly ice/snow covered.			
Station A		х	Stn B has a normal level and is partly ice covered.			
Station B		х				
West Ditch Foot Bridge						
Station C		х	Filled in			
Weir - Upstream			Stn D has a normal level of clear water.			
Station D	Х					
Weir - Downstream			Stations E & F have a trickle flow of clear water.			
Station E	Х					
Station F	X					
Station G	х		Stn G is snow and ice covered.			
Unnamed Ditch						
Station H		х	Stn H has some snow/ice.			
Station I		х	Stn I has some snow/ice.			
Supplemental Inspection Locations (designate station location on page 2 of						
Staff Gauge Level						
Condition of Weir / Hay bale Barriers:			There is a trickle flow from the weir and no flow			
from the outlet pipe. The main area is g	partly ice	covered.	The stream has a trickle flow of			
clear water and has ice cover along the	clear water and has ice cover along the stream banks and snow on the walking trail.					
The Hay Bale line has a trickle flow and is mostly snow and ice covered.						

Date 3/8/2019 Time 8:30 Inspectors Brian Guichard	Date	3/8/2019	Time	8:30	Inspectors	Brian Guichard	_
---	------	----------	------	------	------------	----------------	---

Station	Precipitate Observation		Other Observations			
	Yes	No				
Offsite Fenced Ditch System			Stn A is snow covered.			
Station A		х	Stn B is snow covered.			
Station B		х				
West Ditch Foot Bridge						
Station C		х	Filled in			
Weir - Upstream			Stn D snow and ice covered.			
Station D	Х					
Weir - Downstream			Stations E & F have a trickle flow of clear water.			
Station E	х					
Station F	X					
Station G	х		Stn G is snow covered.			
Unnamed Ditch						
Station H		х	Stn H is snow covered.			
Station I		х	Stn I is snow covered.			
Supplemental Inspection						
Locations (designate						
station location on page 2 of						
Staff Gauge Level						
Condition of Weir / Hay bale Barriers:		,	There is a trickle flow from the weir and no flow			
from the outlet pipe. The main area is a	nostly sn	ow and ic	ce covered. The stream has a trickle flow of			
clear water and has snow and ice cove	r along th	ne stream	n banks and snow on the walking trail.			
The Hay Bale line is snow covered.						

Date	3/15/2019	Time	10:00	Inspectors	Brian Guichard
------	-----------	------	-------	------------	----------------

	M .	pitate				
Station Observation			Other Observations			
	Yes	No				
Offsite Fenced Ditch System			Stn A is snow covered.			
Station A		х	Stn B is snow covered.			
Station B		Х				
West Ditch Foot Bridge						
Station C		X	Filled in			
Weir - Upstream			Stn D snow and ice covered.			
Station D	х					
Weir - Downstream			Stations E & F have a trickle flow of clear water.			
Station E	х	t)				
Station F	х					
Station G	х		Stn G is snow covered.			
Unnamed Ditch						
Station H		х	Stn H is snow covered.			
Station I		х	Stn I is snow covered.			
Supplemental Inspection						
Locations (designate station location on page 2 of						
Staff Gauge Level						
			There is a trickle flow from the weir and no flow			
Condition of Weir / Hay bale Barriers:						
			ce covered. The stream has a trickle flow of			
clear water and has snow and ice cove	clear water and has snow and ice cover along the stream banks and snow on the walking trail.					
	···					
The Hay Bale line is snow covered.						

Date	3/22/2019	Time	9:30	Inspectors	Brian Guichard
				•	

Station		pitate vation	Other Observations		
Yes No					
Offsite Fenced Ditch System			Stn A has an elevated level of clear water.		
Station A		х	Stn B has an elevated level of clear water.		
Station B		х			
West Ditch Foot Bridge					
Station C		X	Filled in		
Weir - Upstream			Stn D has a high level of clear water		
Station D	х				
Weir - Downstream			Stations E & F have a moderate flow of clear water.		
Station E	х				
Station F	х				
Station G	х		Stn G has a moderate flow of clear water.		
Unnamed Ditch					
Station H		х	Stn H is flooded.		
Station I		х	Stn I is flooded.		
Supplemental Inspection					
Locations (designate station location on page 2 of					
Staff Gauge Level					
Condition of Weir / Hay bale Barriers:		- 7	There is a medium flow from the weir and a medium flow		
·	clear. The	•	has a moderate flow of clear water. The walking trail		
is mostly mud from an ongoing rain ev					
is mostly mad from an ongoing rain event.					
The Hay Bale line has a moderate flow	of clear	water			
The tray sale and fide a moderate new or older water.					
Note: there is an ongoing rain event with moderate to heavy periods of rain fall.					
note. there is an originity run ordina min moderate to nearly periods of fair fair.					

Olin Corporation

Wilmington Site Interim Action Plan

South and West Ditch Precipitate Inspection Report

 Date:
 3/29/2019
 Time:
 11:00
 Inspectors:
 Shawna lacozzi

 ~50 °F; light rain
 -50 °F; lig

Precipitate Station Observation		pitate	Other Observations			
		rvation				
	Yes No					
Off-site Fenced Ditch System						
Station A		X	A: High level of clear water			
Station B		Х	B: High level of clear water			
West Ditch Foot Bridge						
Station C			C: Filled in			
Weir - Upstream						
Station D	Х		D: Med/high level and flow of clear water w/ a brown-rust bottom			
Weir - Downstream	_					
Station E	х		E&F: Moderate level and flow of clear water, algae growth noted on water surface			
Station F	x					
Station G	Х		G: Moderate level and flow of clear water, algae growth noted on water surface			
Unnamed Ditch						
Station H		х	H: Saturated soil/mud			
Station I		Х	I: Saturated soil/mud			
Supplemental Inspection						
Locations (designate station						
location on page 2 of 2)						
Staff Gauge Level						
Condition of Weir / Hay Bale Barriers:						
There was a moderate flow of clear water	from Plant	B outlet, an	d from the Weir Outlet.			
The Main Area: The main area was clear	The Main Area: The main area was clear with some algae growth noted. The stream had a moderate level & flow of clear water w/ algae noted					
growing on the surface of the water.						
The Hay Bale Line: Moderate level and flow of clear water w/ rust bottom.						
White tail deer were noted near the main area.						

wood.

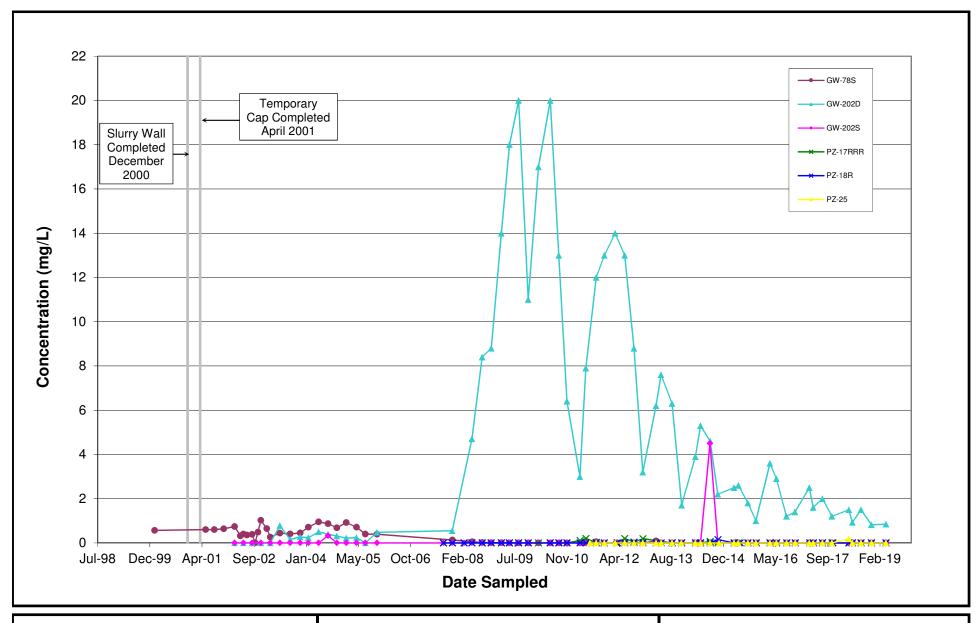
Appendix D

Slurry Wall/Cap Groundwater, Surface Water, and Sediment Time Series Plots

wood.

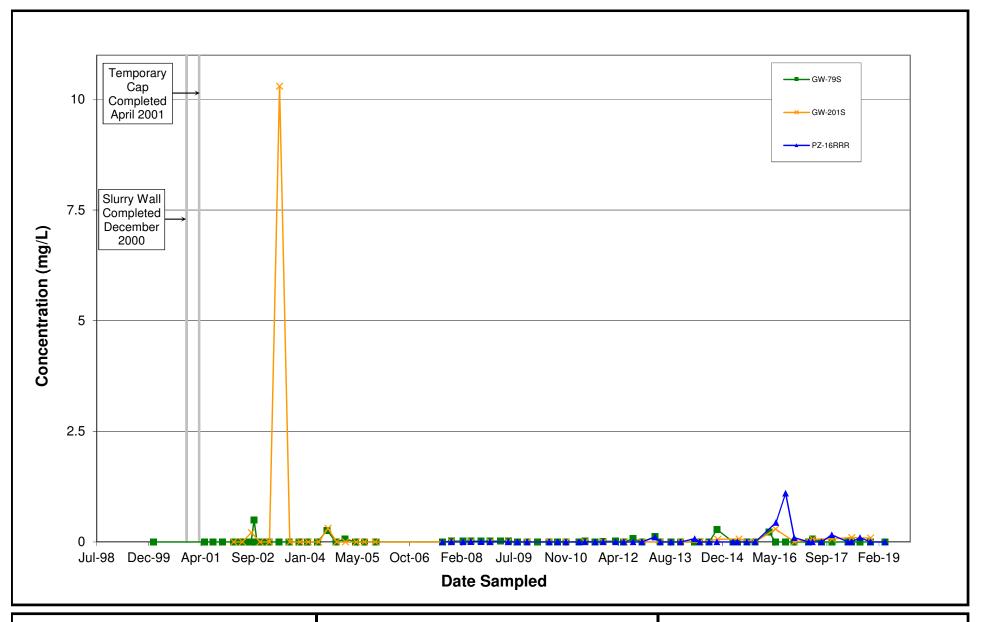
Appendix D1

Groundwater (Aluminum, Ammonia, Chloride, Chromium, Sulfate)



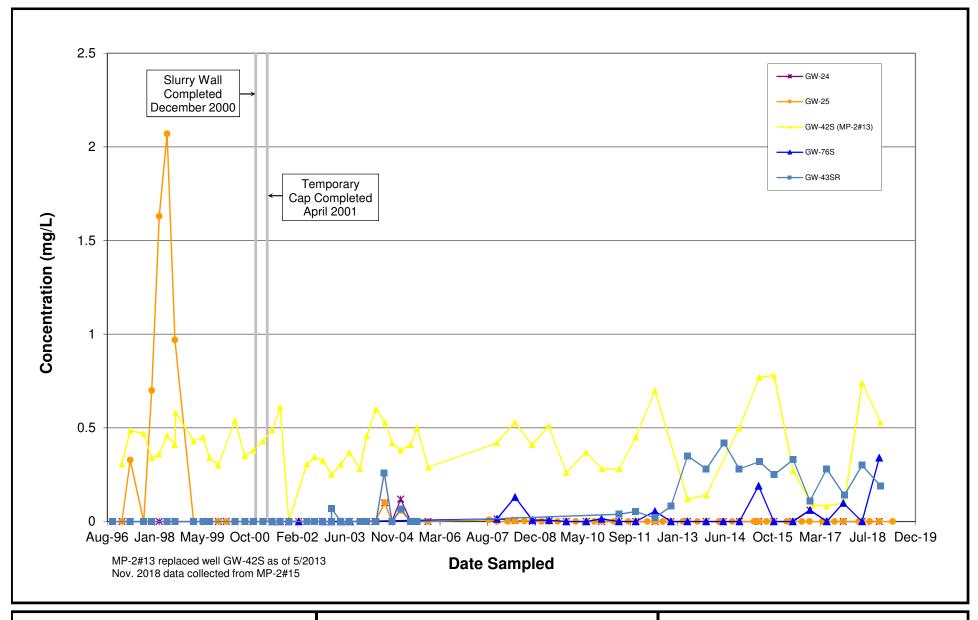


Filtered Aluminum in Groundwater South of Containment Structure



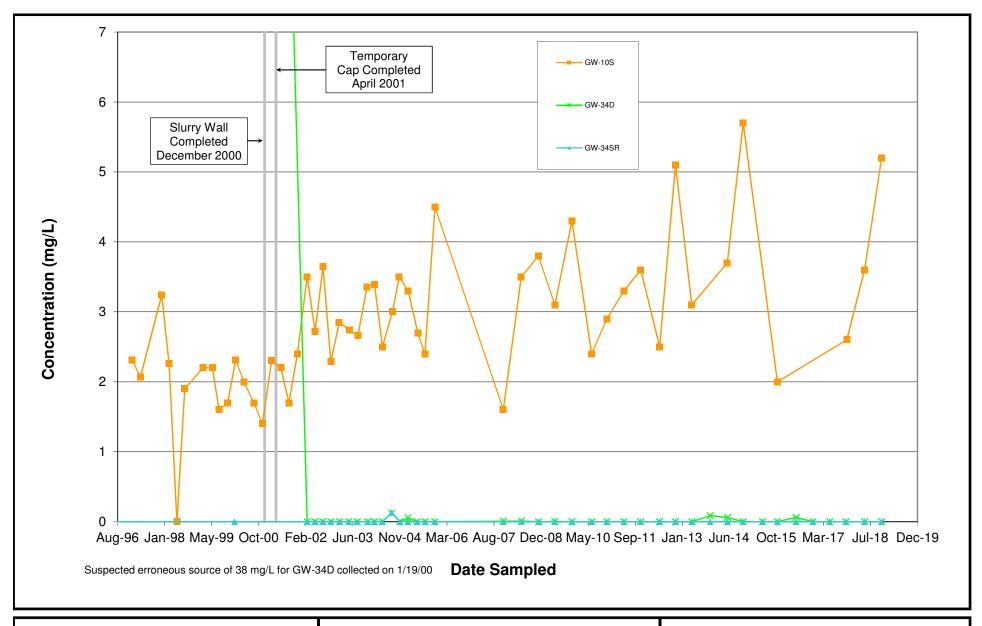
wood.

Filtered Aluminum in Groundwater Southeast of Containment Structure



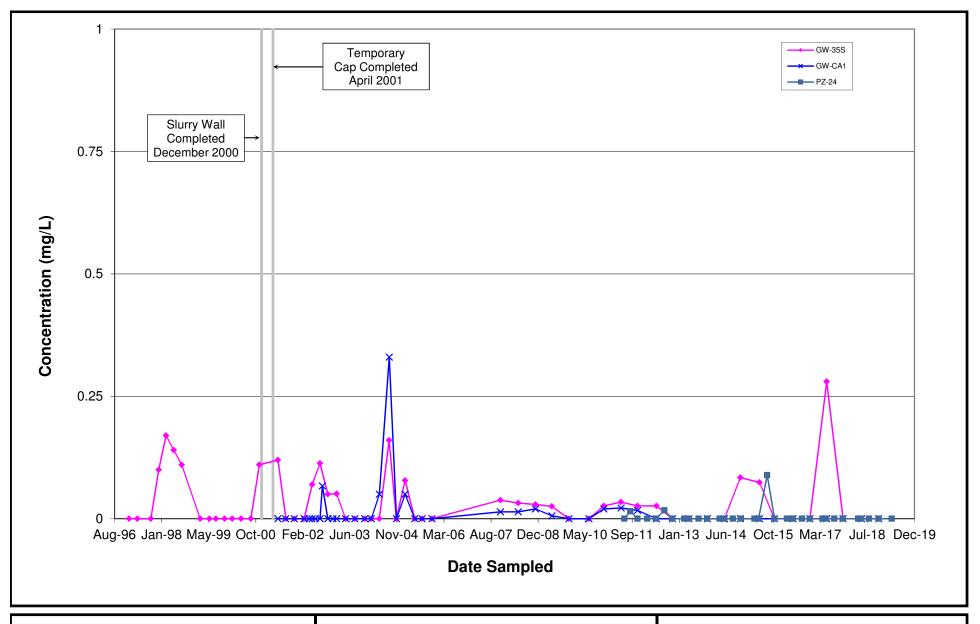
wood.

Filtered Aluminum in Groundwater West of Containment Structure



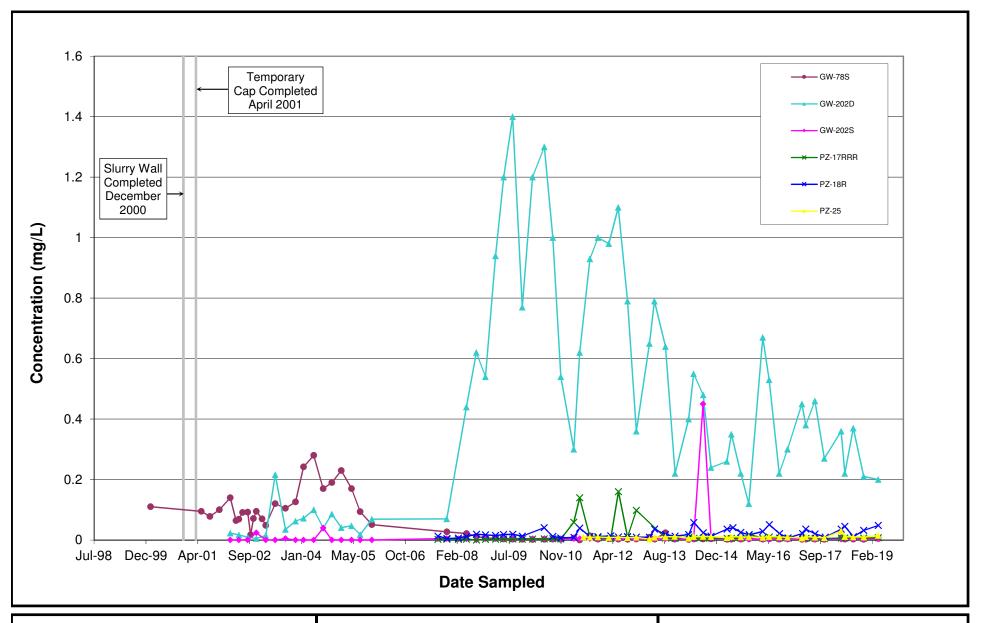


Filtered Aluminum in Groundwater North of Containment Structure



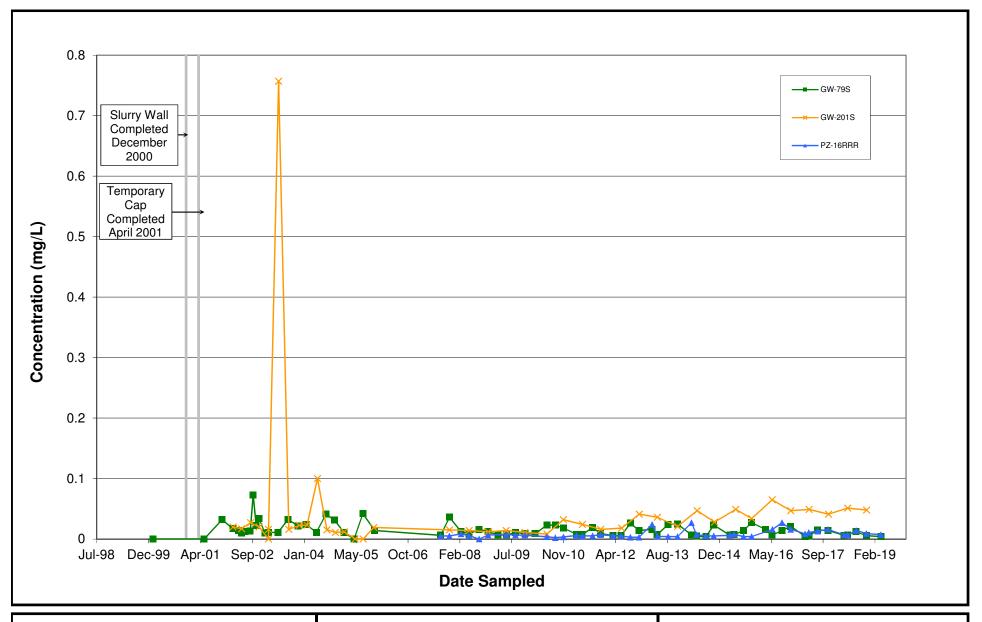


Filtered Aluminum in Groundwater Inside Containment Structure



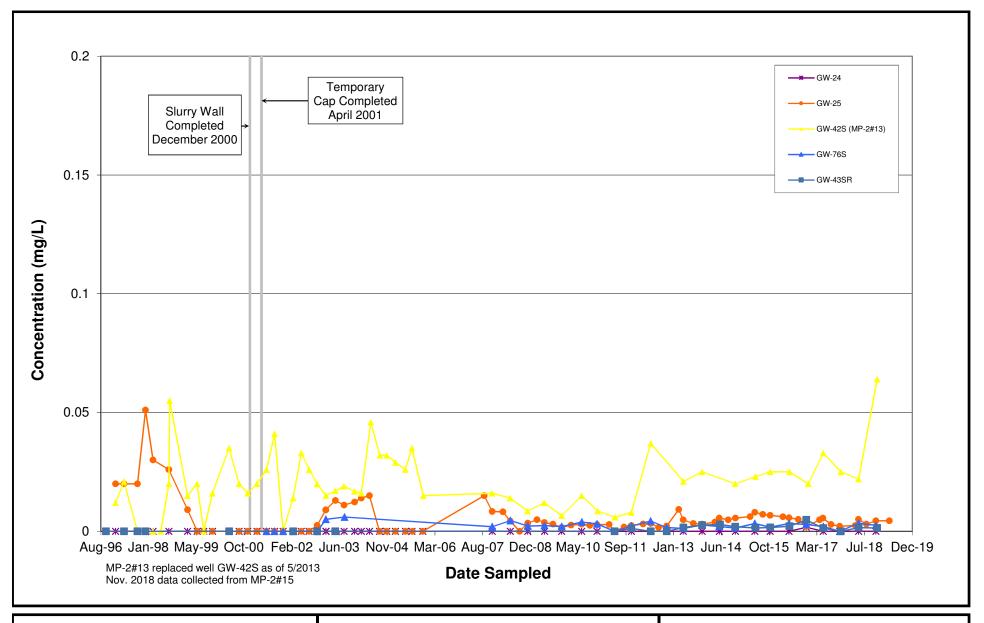


Filtered Chromium in Groundwater South of Containment Structure



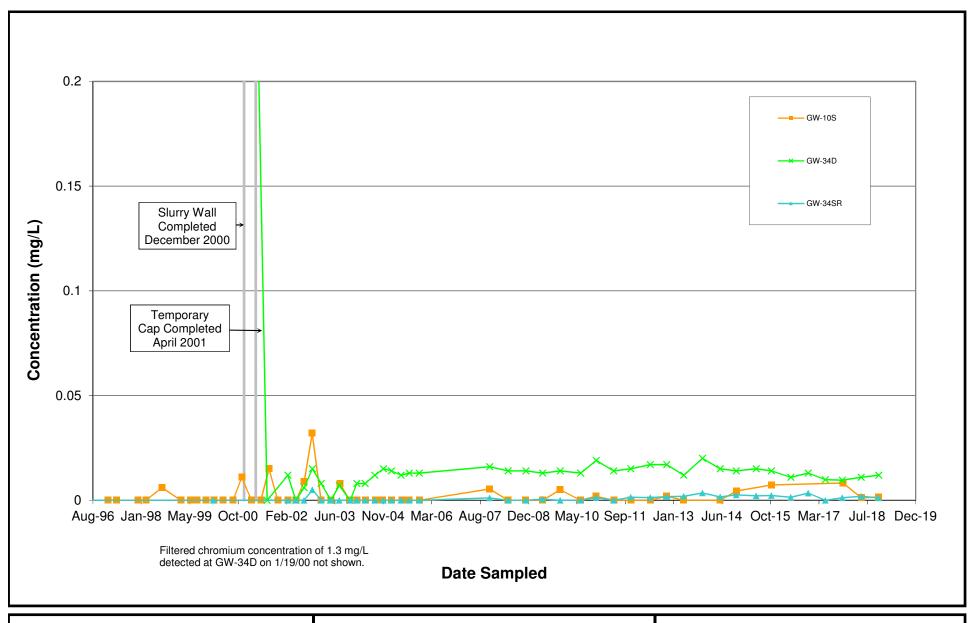


Filtered Chromium in Groundwater Southeast of Containment Structure



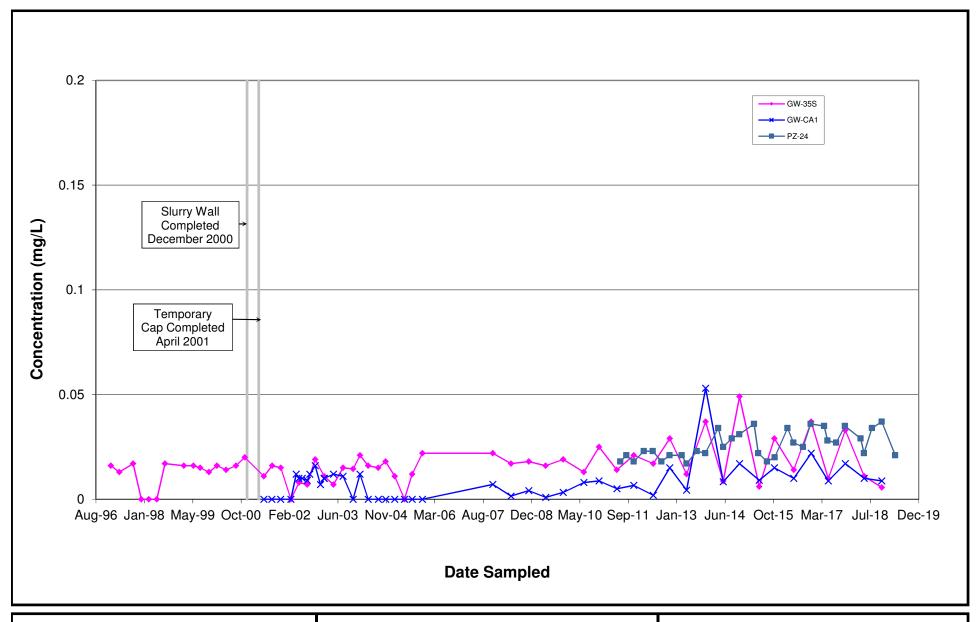


Filtered Chromium in Groundwater West of Containment Structure



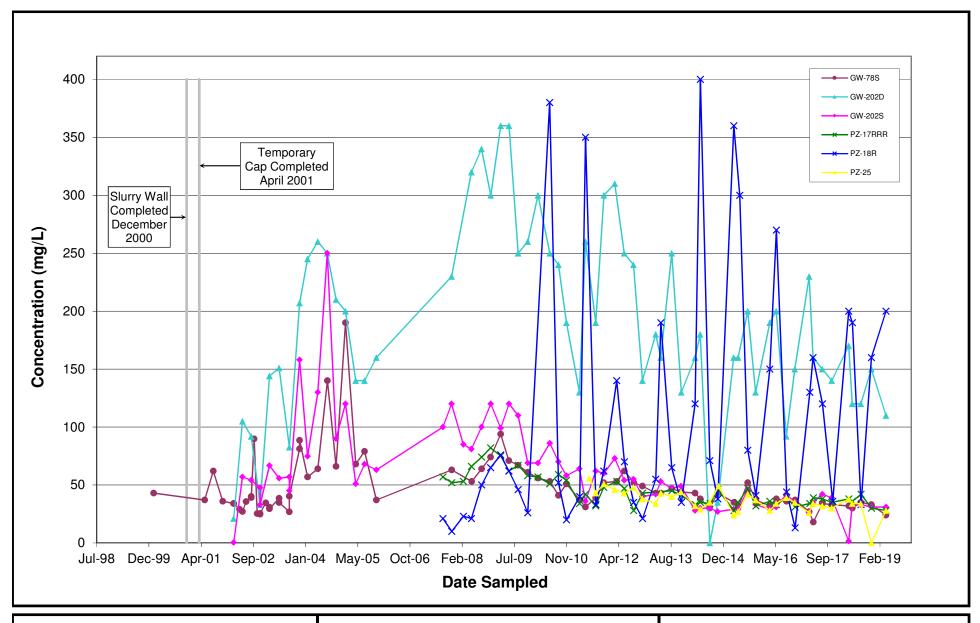


Filtered Chromium in Groundwater North of Containment Structure



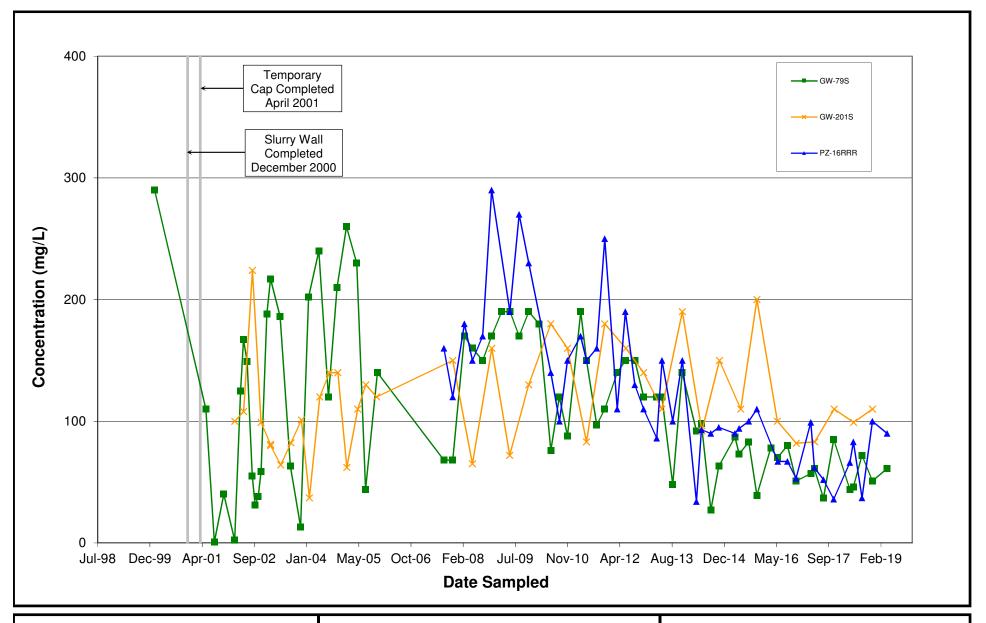
wood.

Filtered Chromium in Groundwater Inside Containment Structure



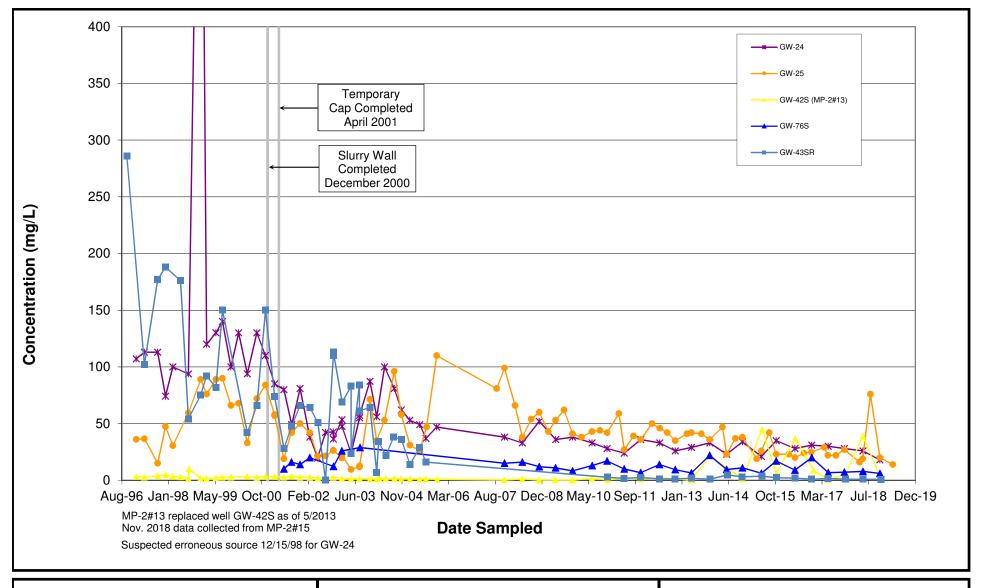


Ammonia in Groundwater South of Containment Structure



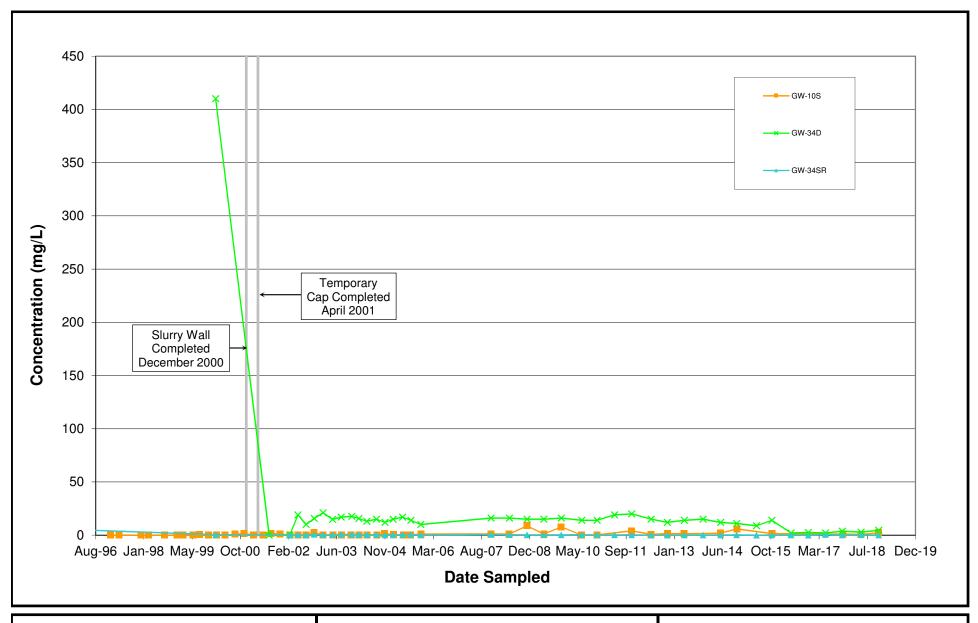


Ammonia in Groundwater Southeast of Containment Structure



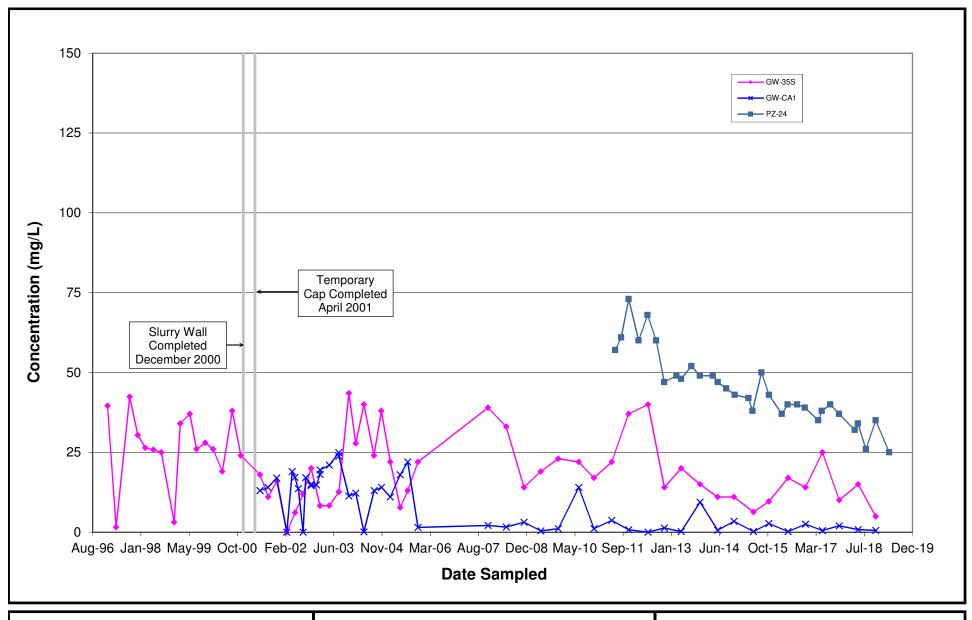


Ammonia in Groundwater West of Containment Structure



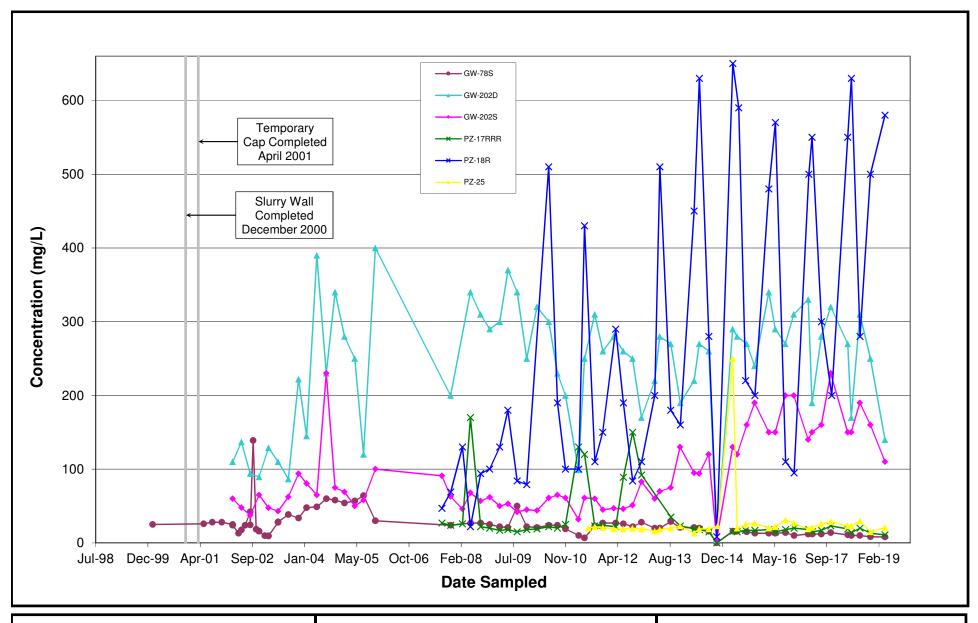
wood.

Ammonia in Groundwater North of Containment Structure



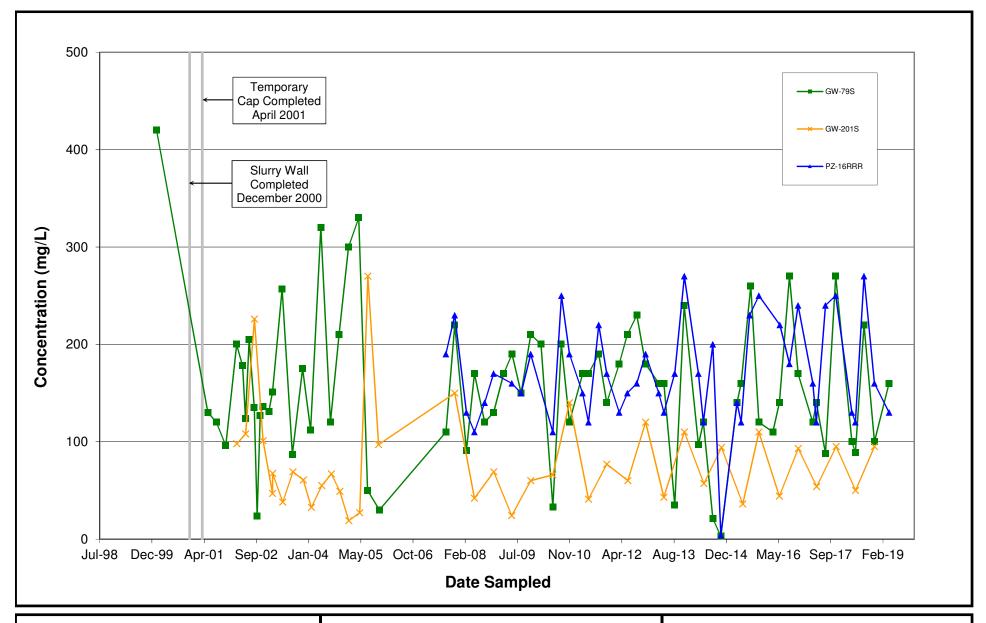
wood.

Ammonia in Groundwater Inside Containment Structure



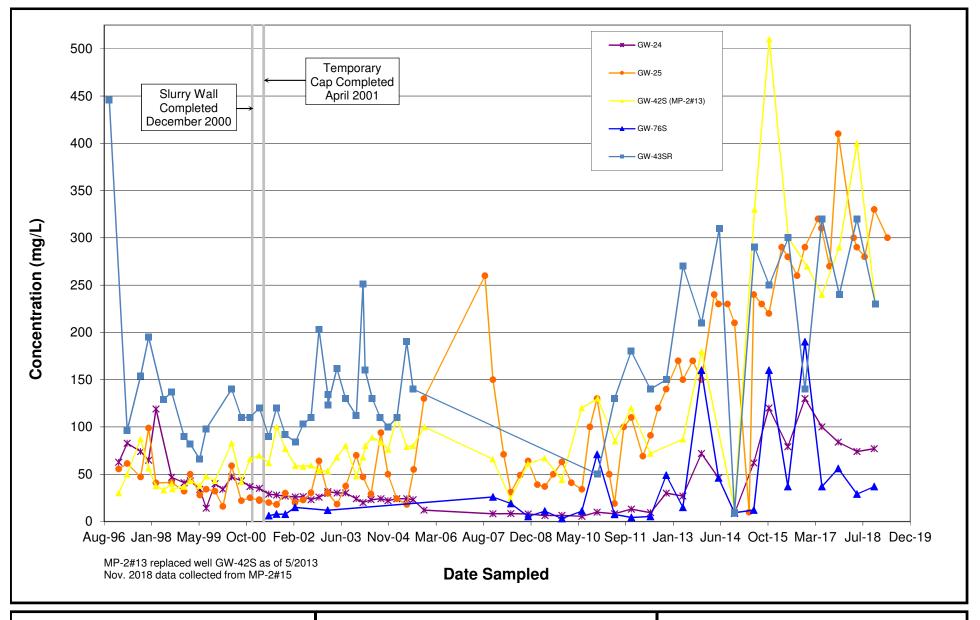


Chloride in Groundwater South of Containment Structure



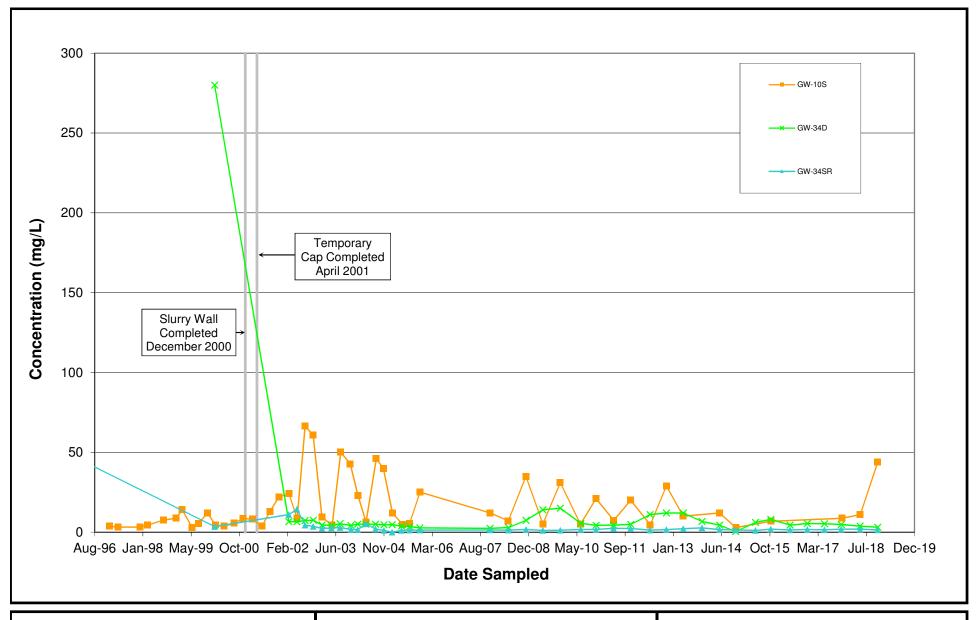


Chloride in Groundwater Southeast of Containment Structure



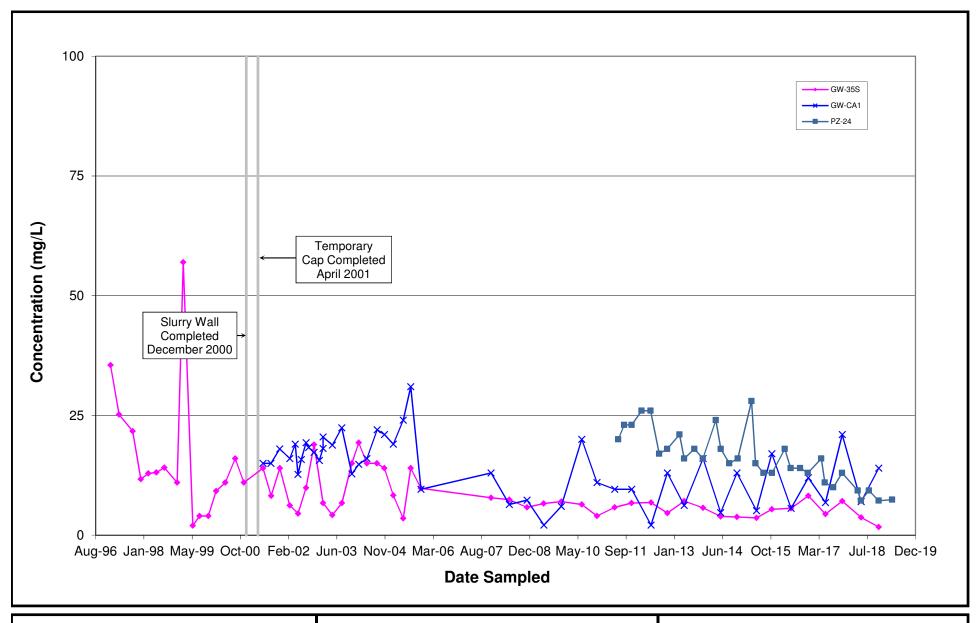
wood.

Chloride in Groundwater West of Containment Structure



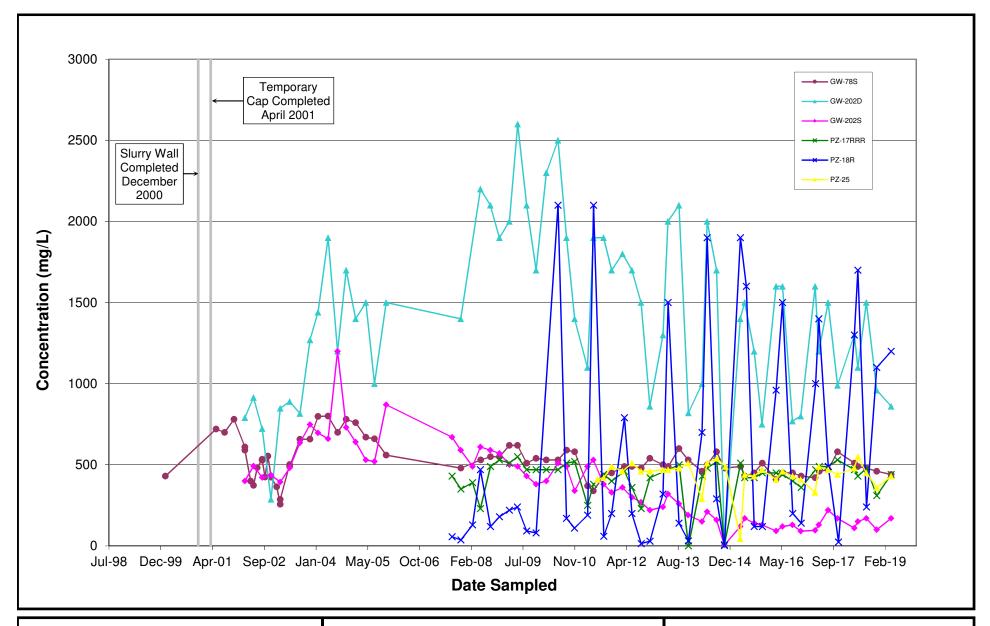
wood.

Chloride in Groundwater North of Containment Structure



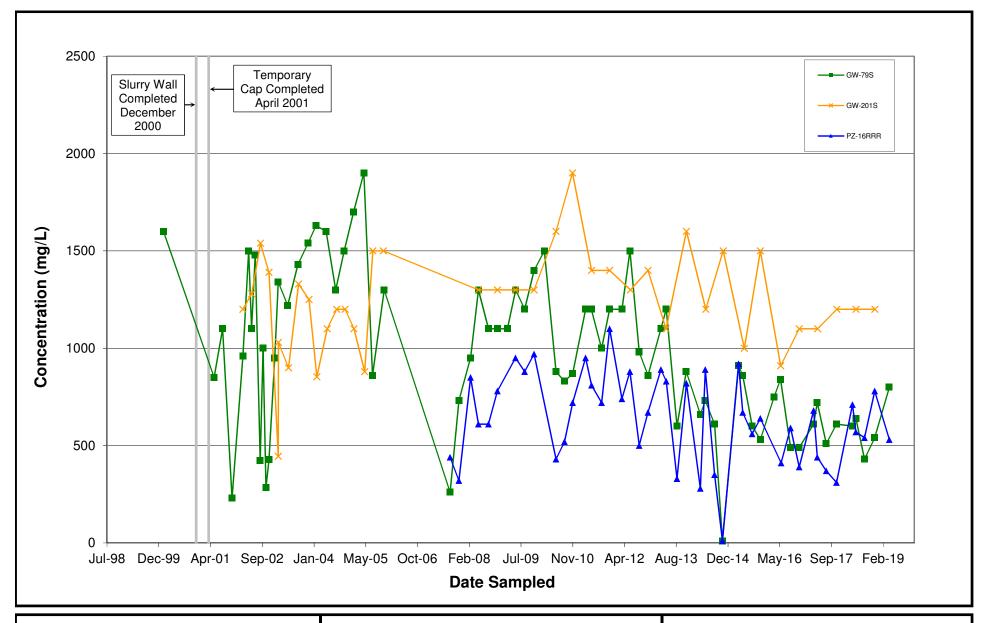
wood.

Chloride in Groundwater Inside Containment Structure



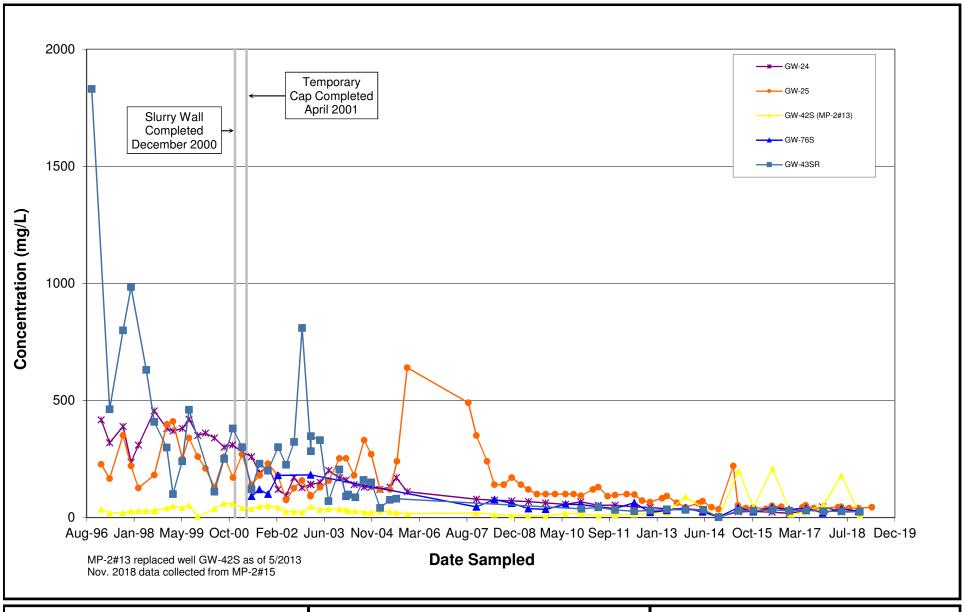
wood.

Sulfate in Groundwater South of Containment Structure



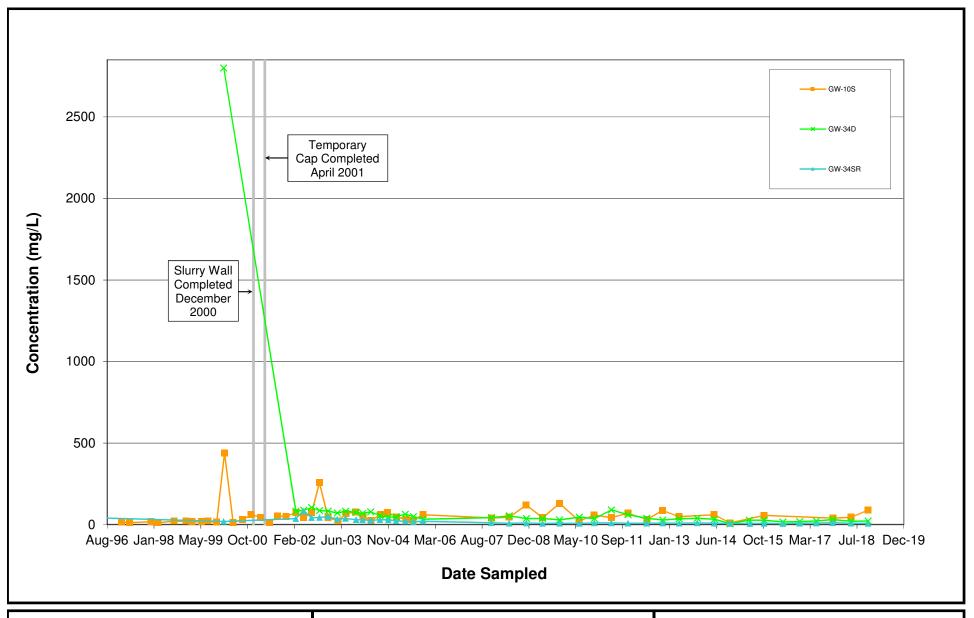
wood.

Sulfate in Groundwater Southeast of Containment Structure



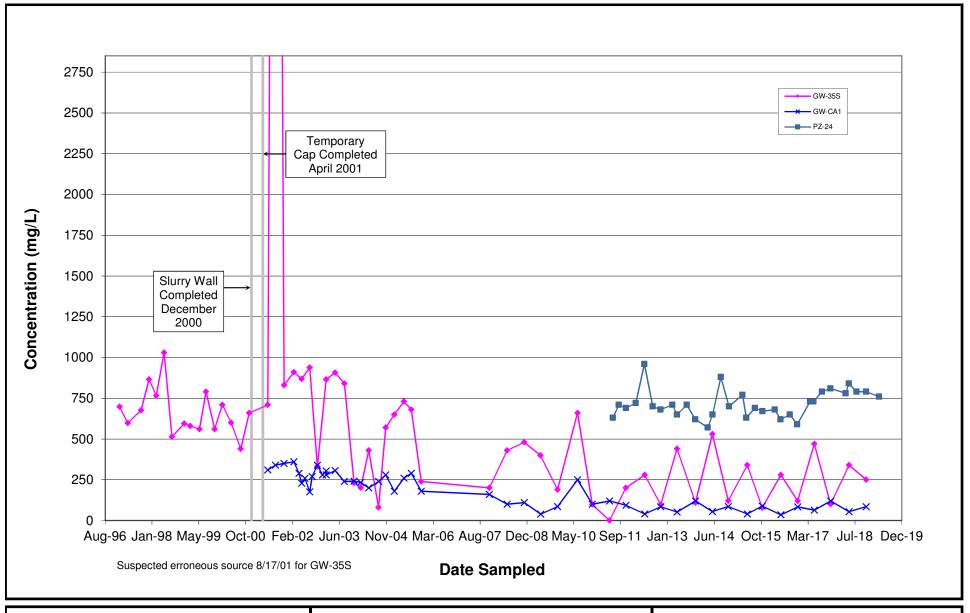
wood.

Sulfate in Groundwater West of Containment Structure



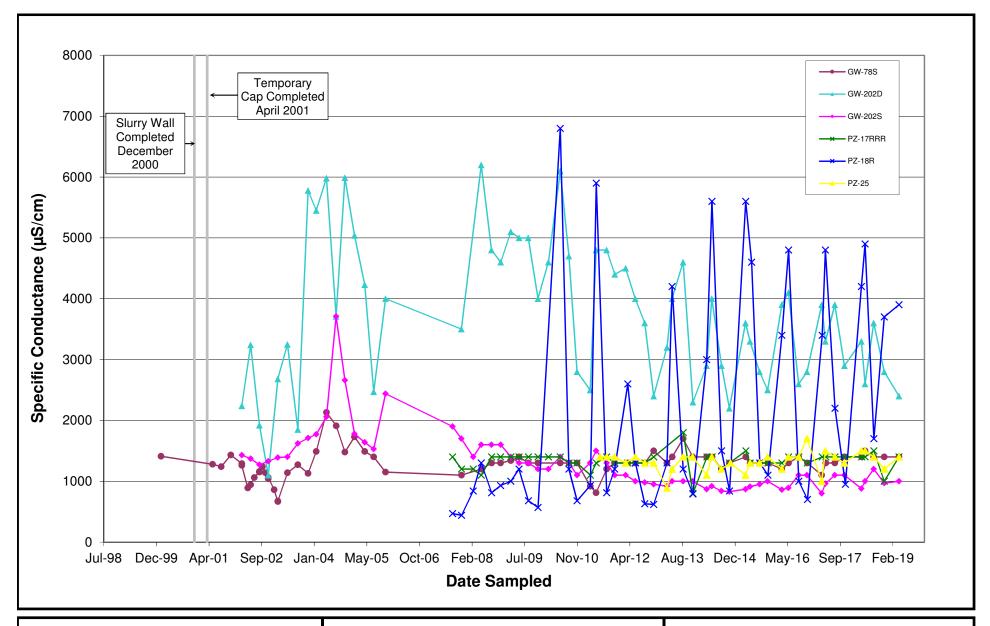
wood.

Sulfate in Groundwater North of Containment Structure



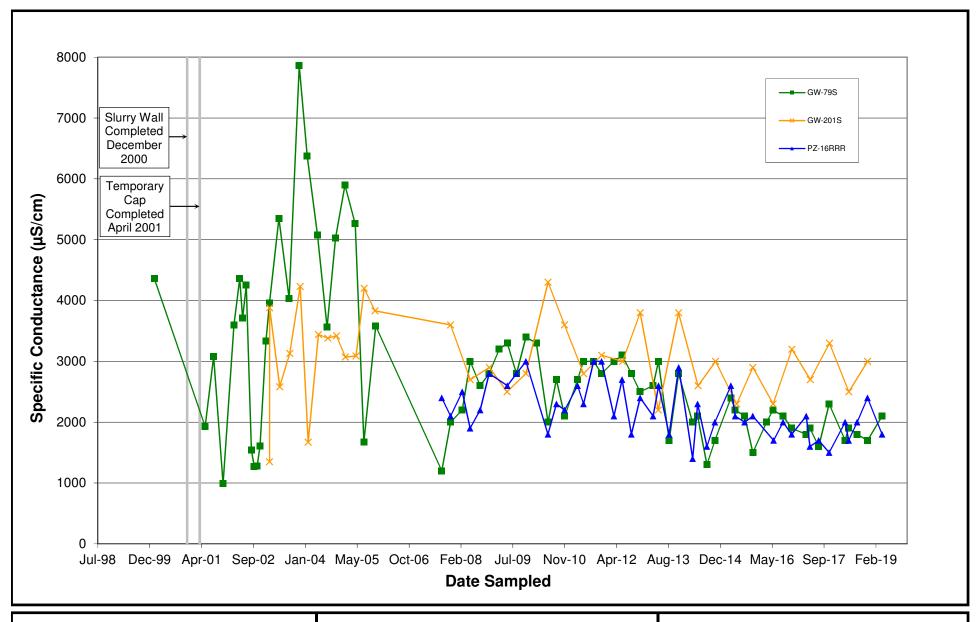
wood.

Sulfate in Groundwater Inside Containment Structure



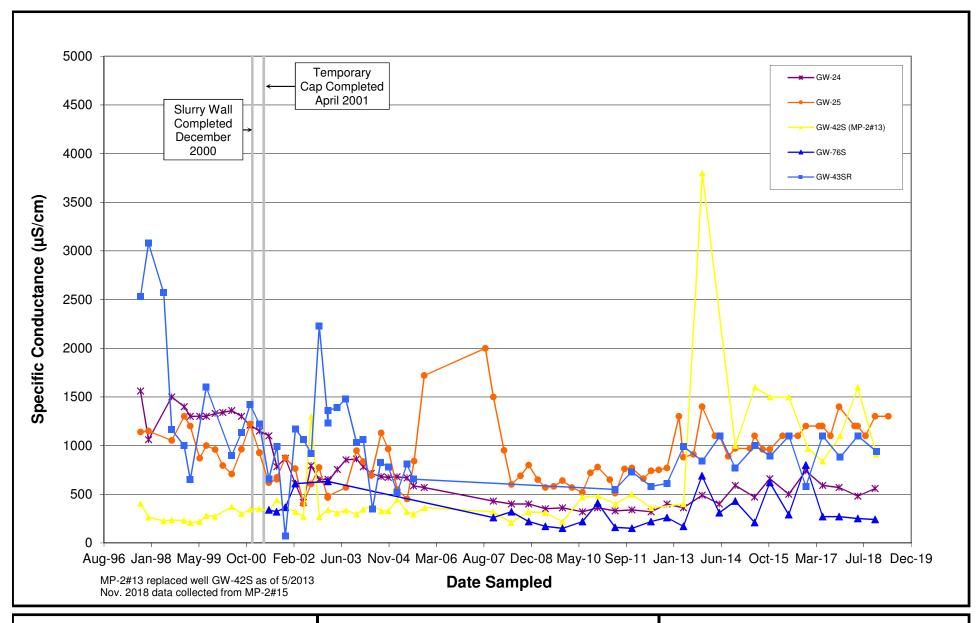


Specific Conductance in Groundwater South of Containment Structure



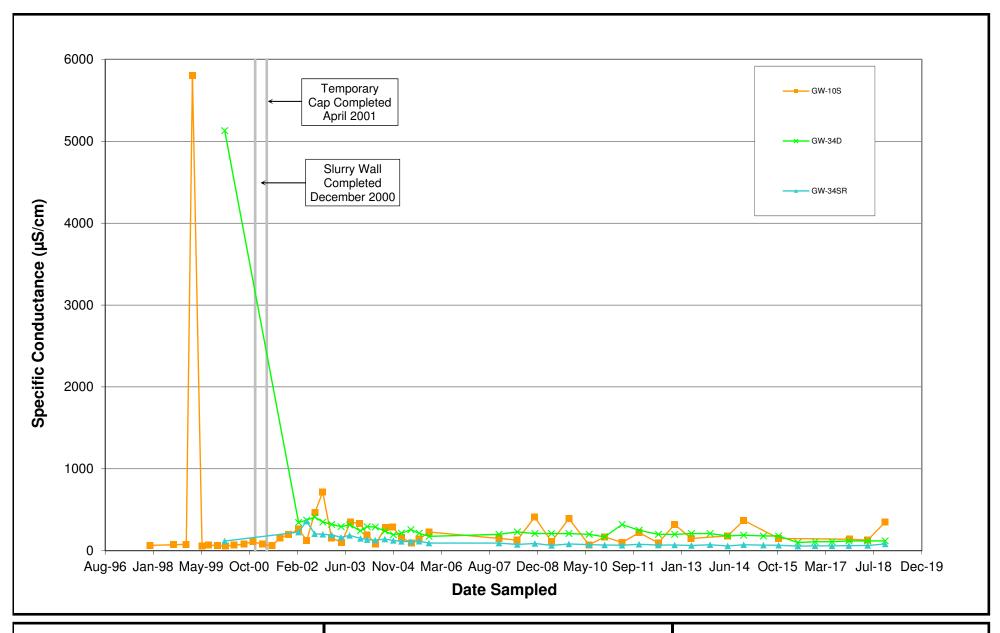


Specific Conductance in Groundwater Southeast of Containment Structure



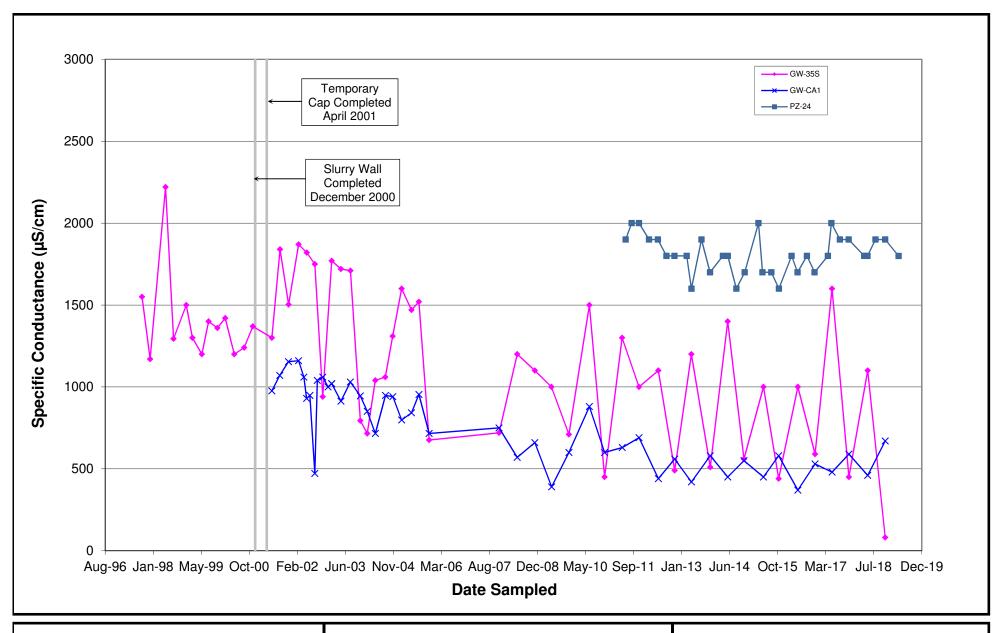


Specific Conductance in Groundwater West of Containment Structure



wood.

Specific Conductance in Groundwater North of Containment Structure



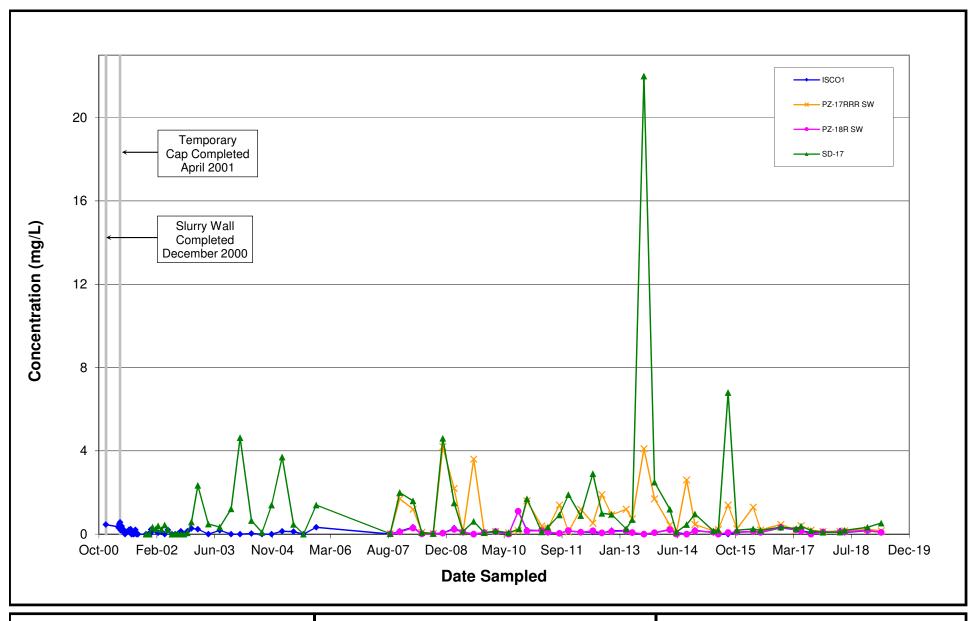
wood.

Specific Conductance in Groundwater Inside Containment Structure

wood.

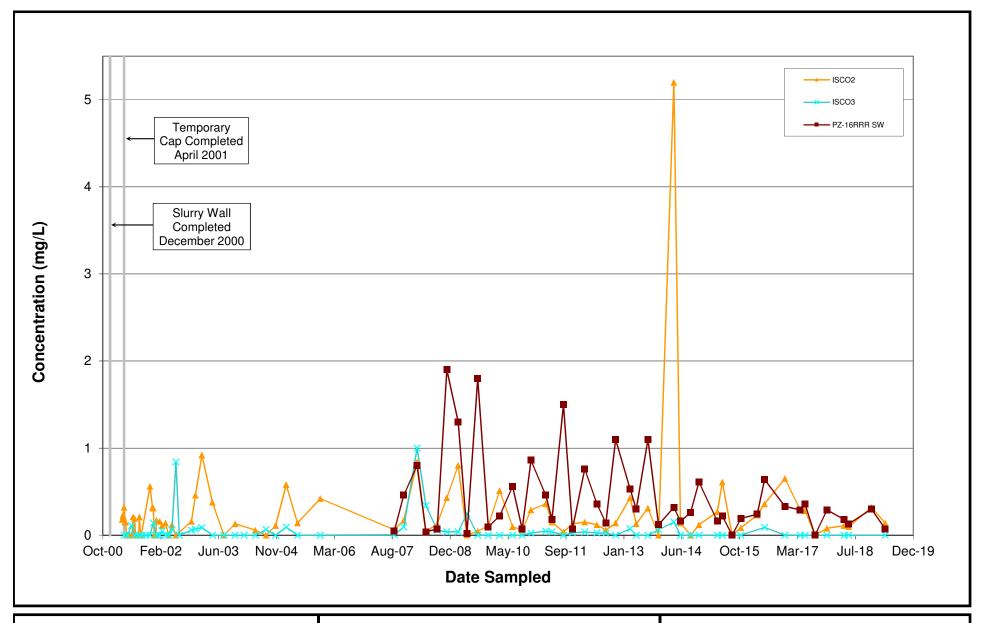
Appendix D2

Surface Water (Aluminum, Ammonia, Chloride, Chromium, Sulfate)



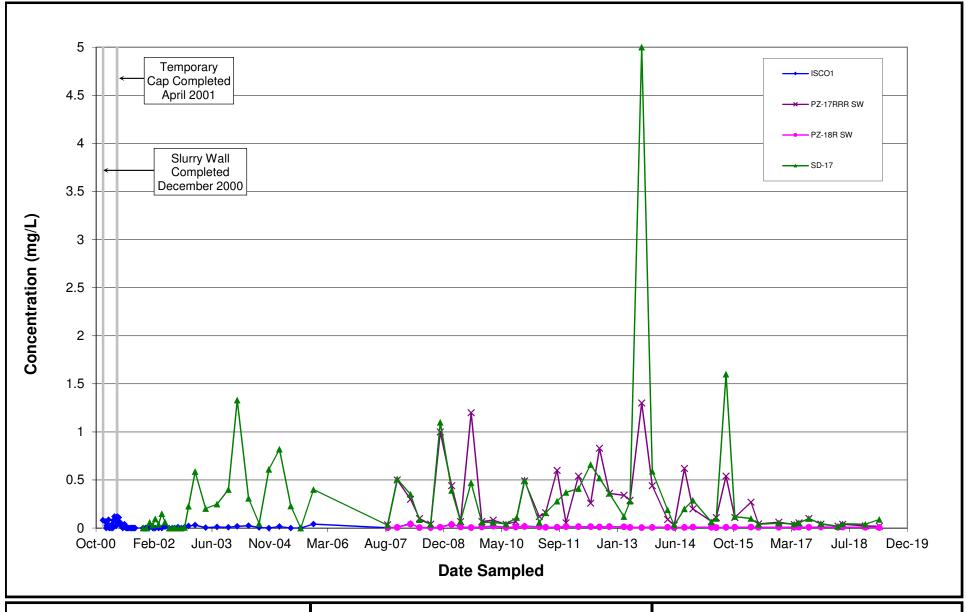
wood.

Filtered Aluminum in Surface Water in the Upper South Ditch



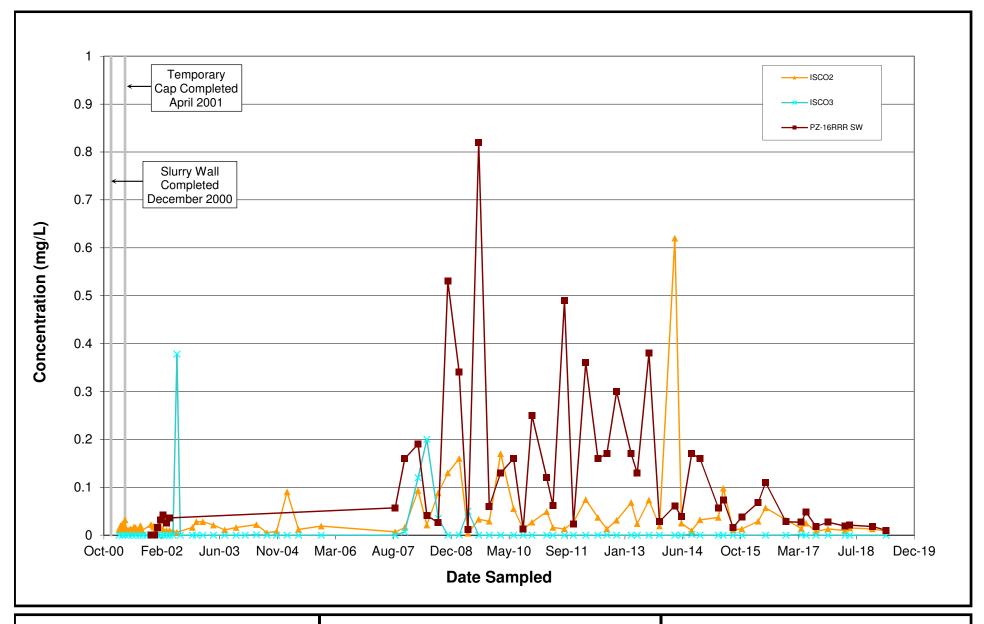


Filtered Aluminum in Surface Water in the Lower South Ditch



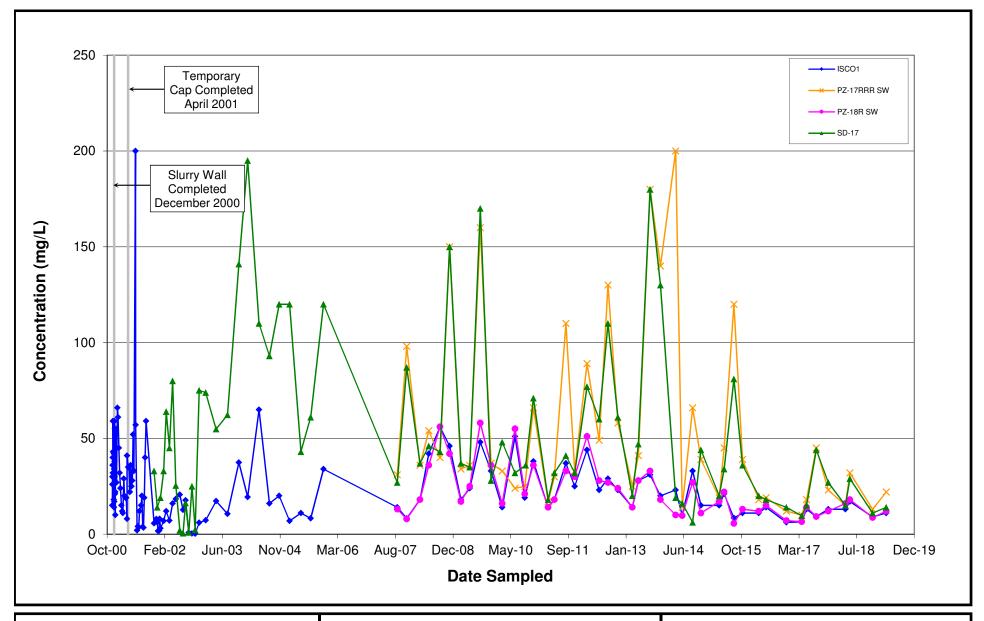
wood.

Filtered Chromium in Surface Water in the Upper South Ditch



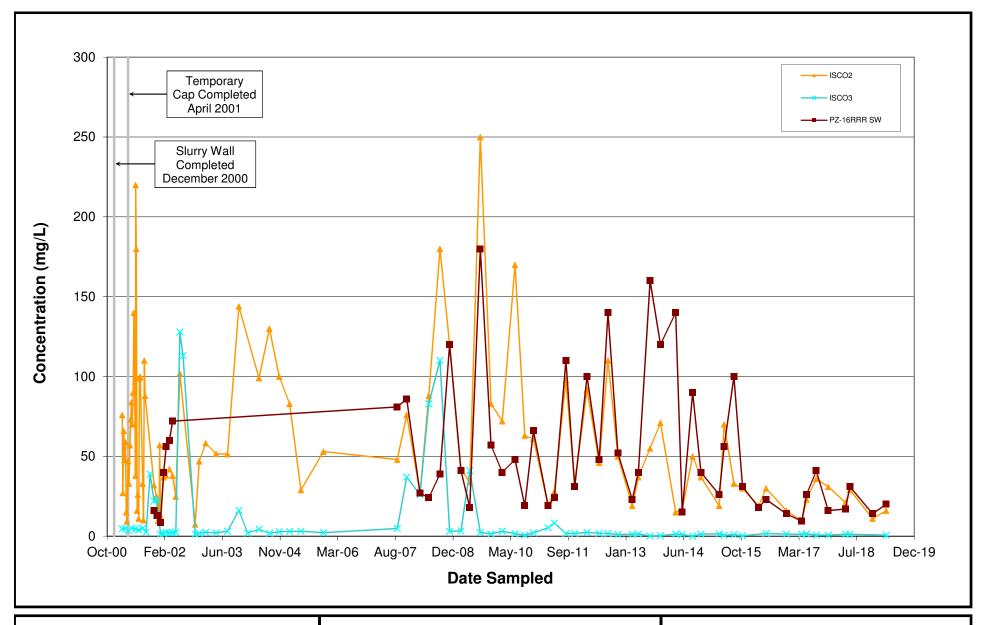


Filtered Chromium in Surface Water in the Lower South Ditch



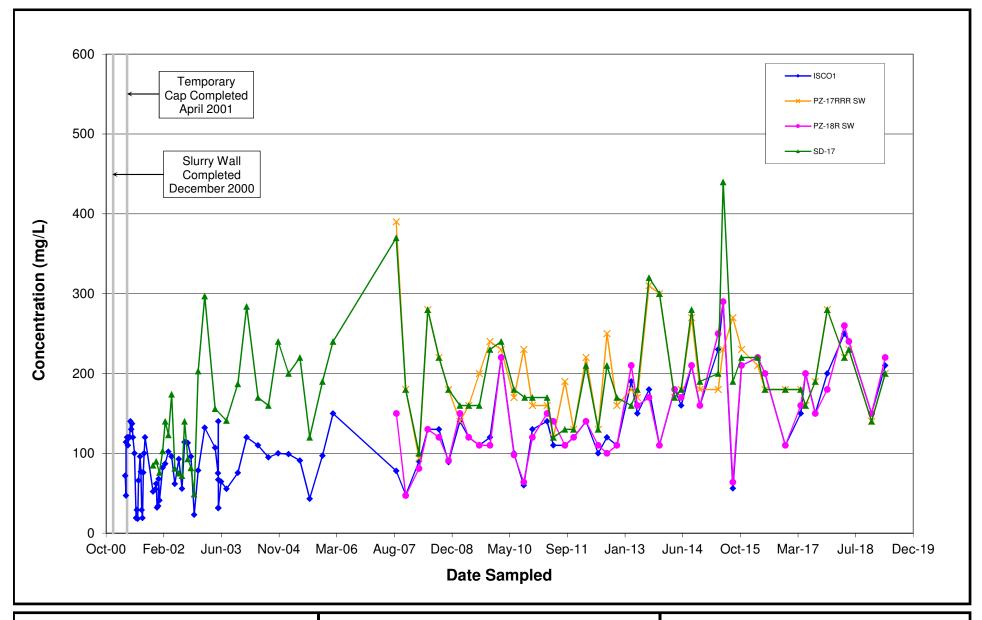


Ammonia in Surface Water in the Upper South Ditch



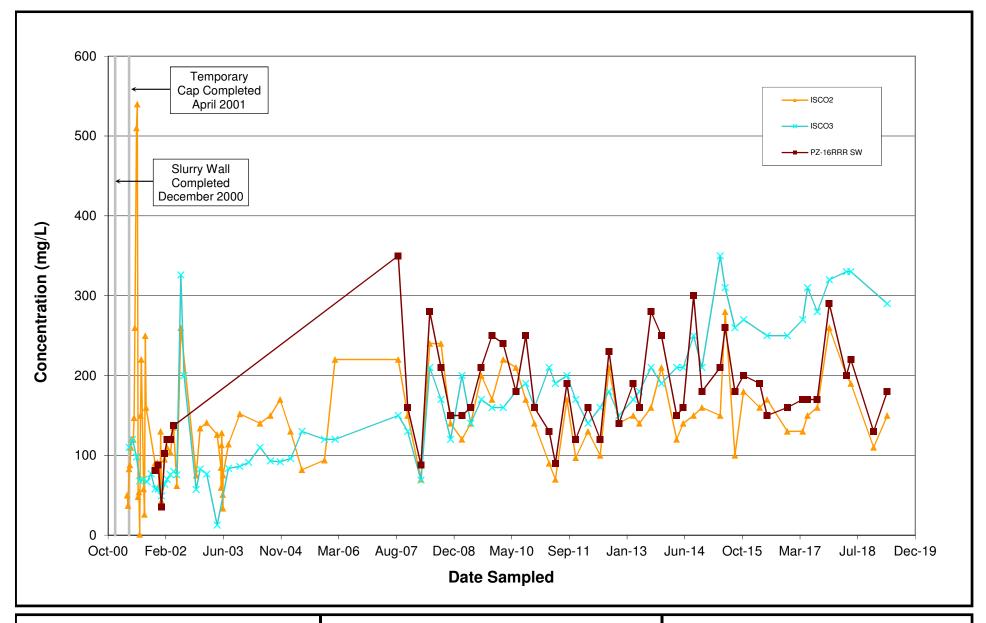


Ammonia in Surface Water in the Lower South Ditch



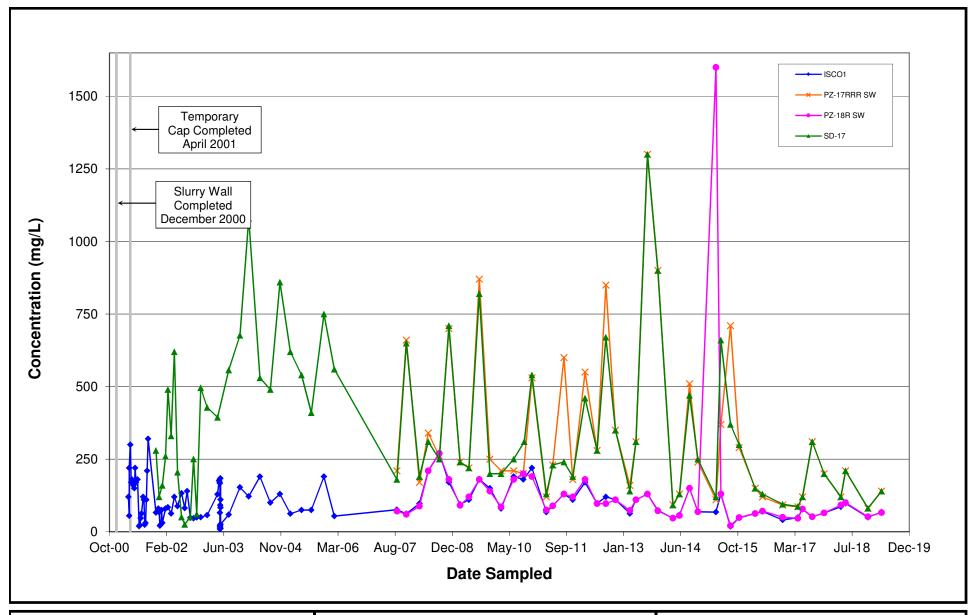
wood.

Chloride in Surface Water in the Upper South Ditch



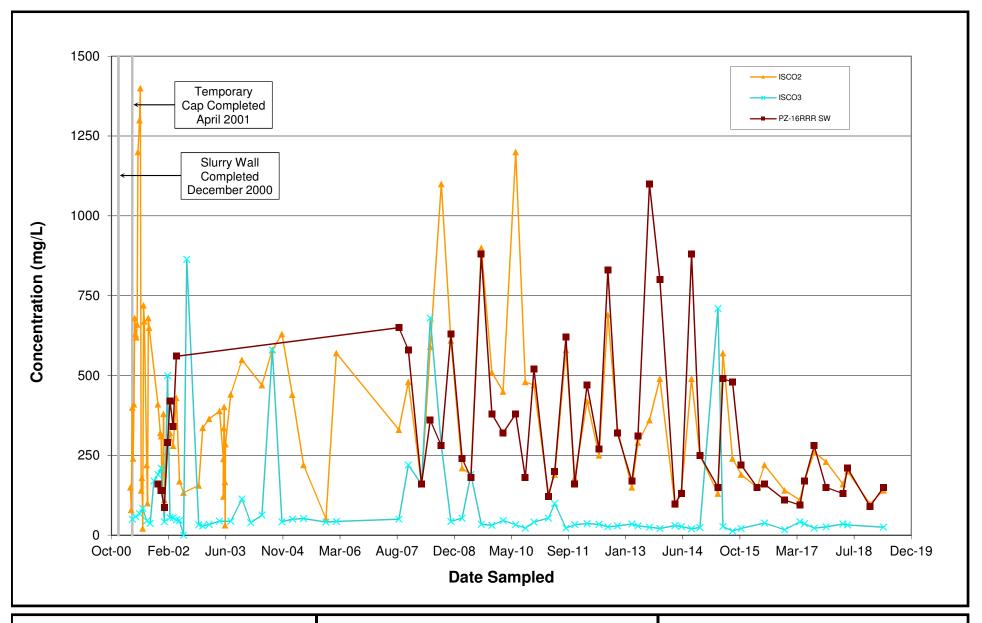


Chloride in Surface Water in the Lower South Ditch



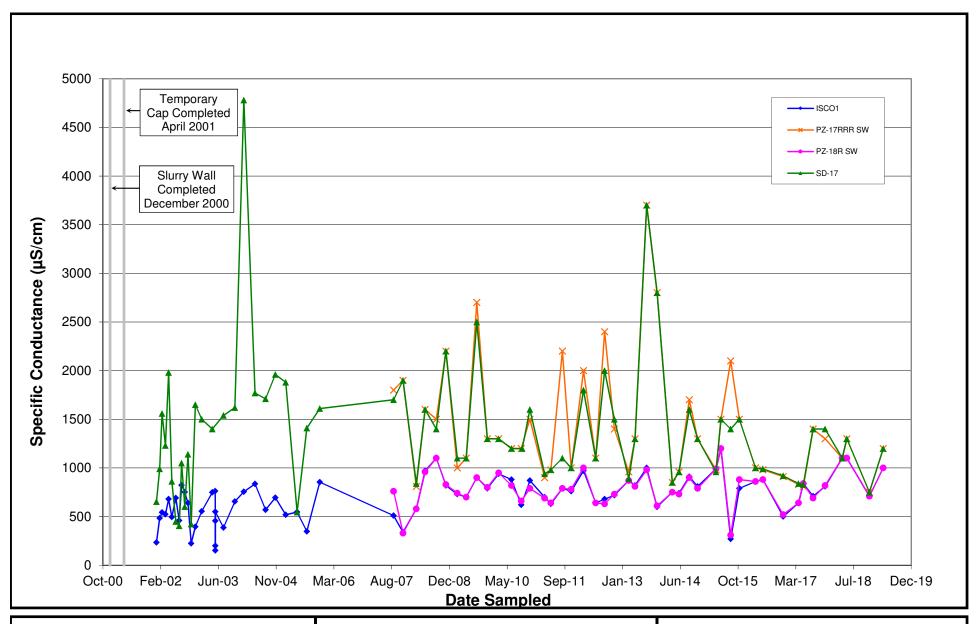
wood.

Sulfate in Surface Water in the Upper South Ditch



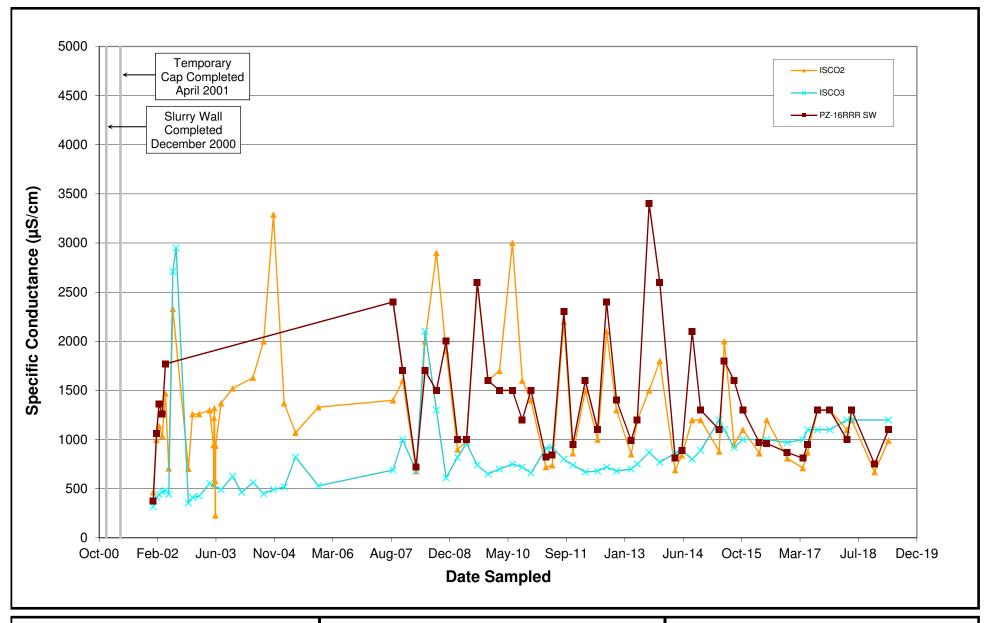


Sulfate in Surface Water in the Lower South Ditch



wood.

Specific Conductance in Surface Water in the Upper South Ditch



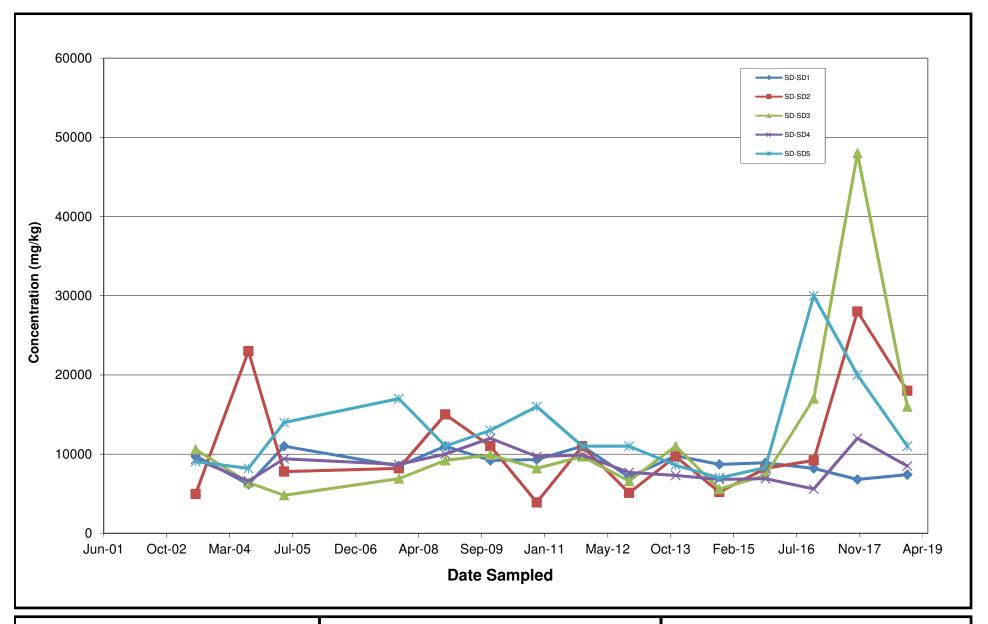
wood.

Specific Conductance in Surface Water in the Lower South Ditch

wood.

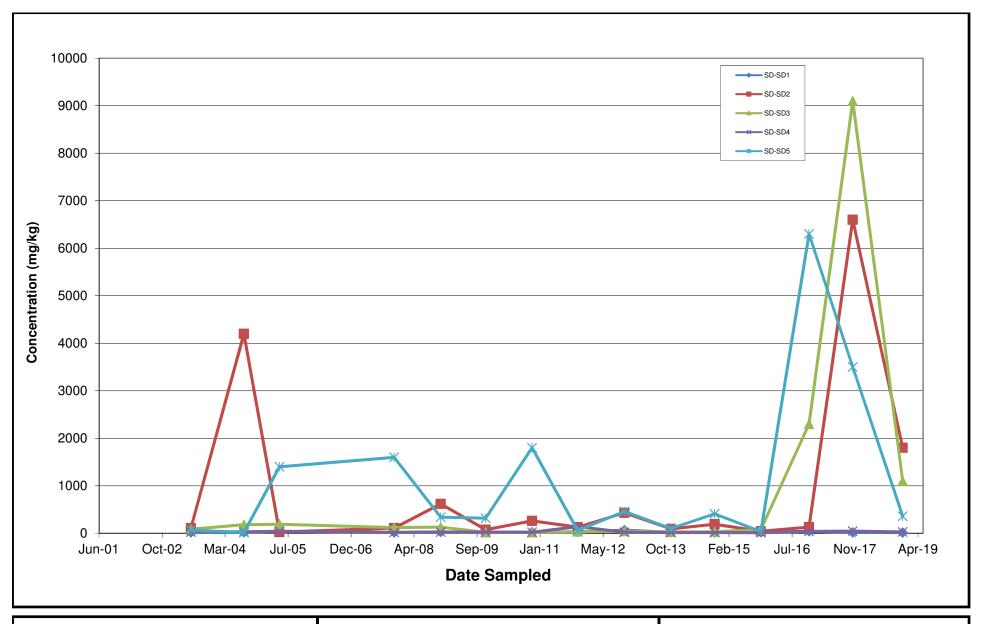
Appendix D3

Sediment (Aluminum, Chromium, Iron)



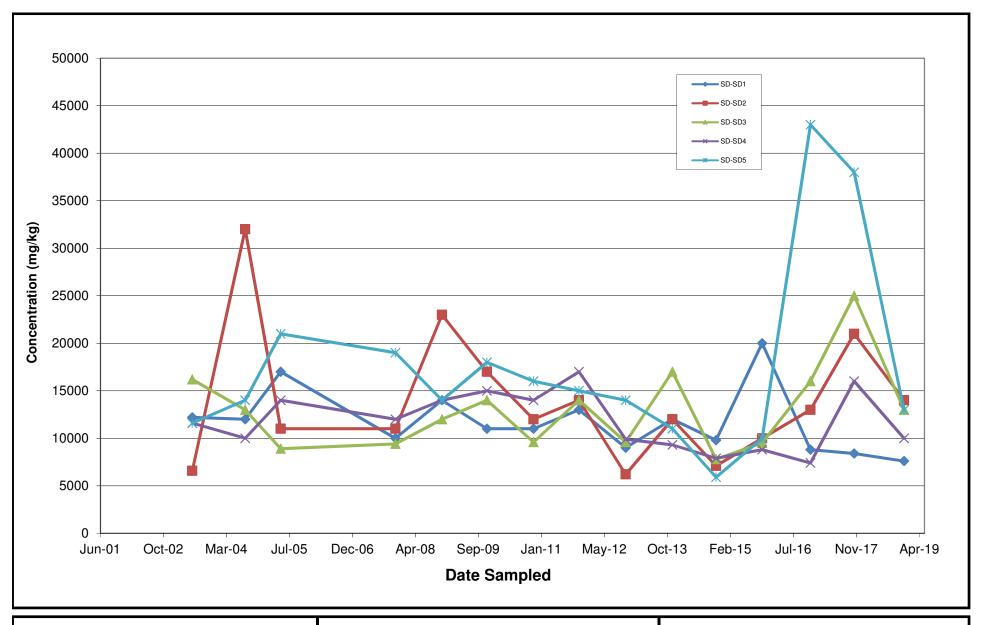


Aluminum Concentrations in Shallow Sediment (0-0.5 feet)



wood.

Chromium Concentrations in Shallow Sediment (0-0.5 feet)



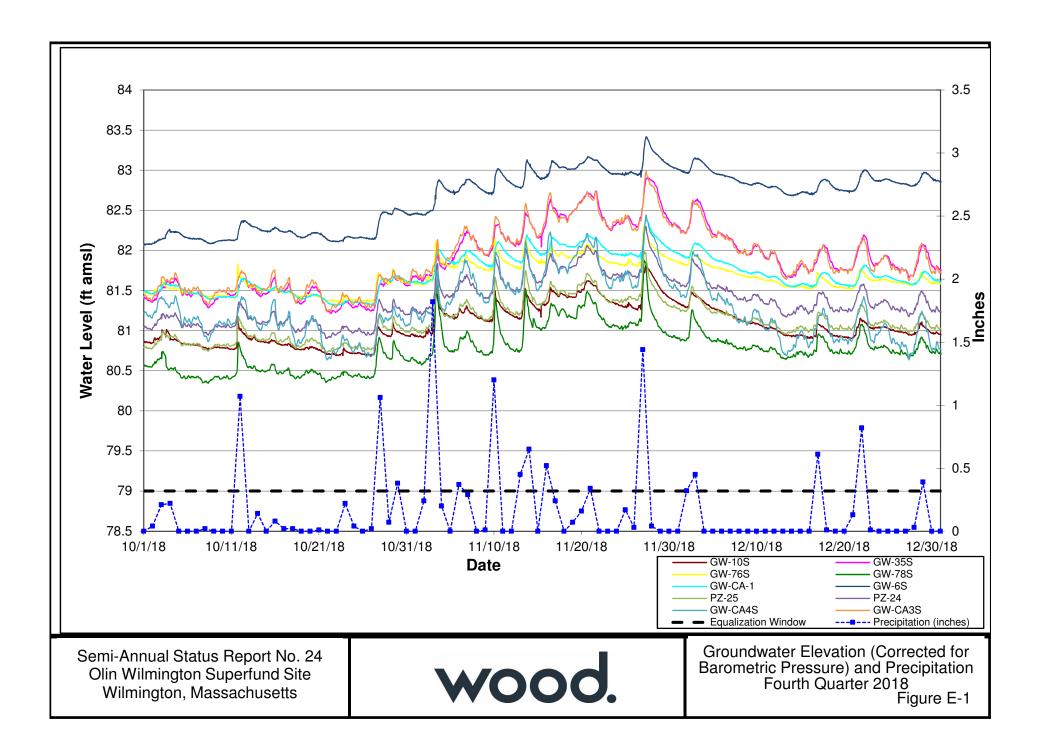
wood.

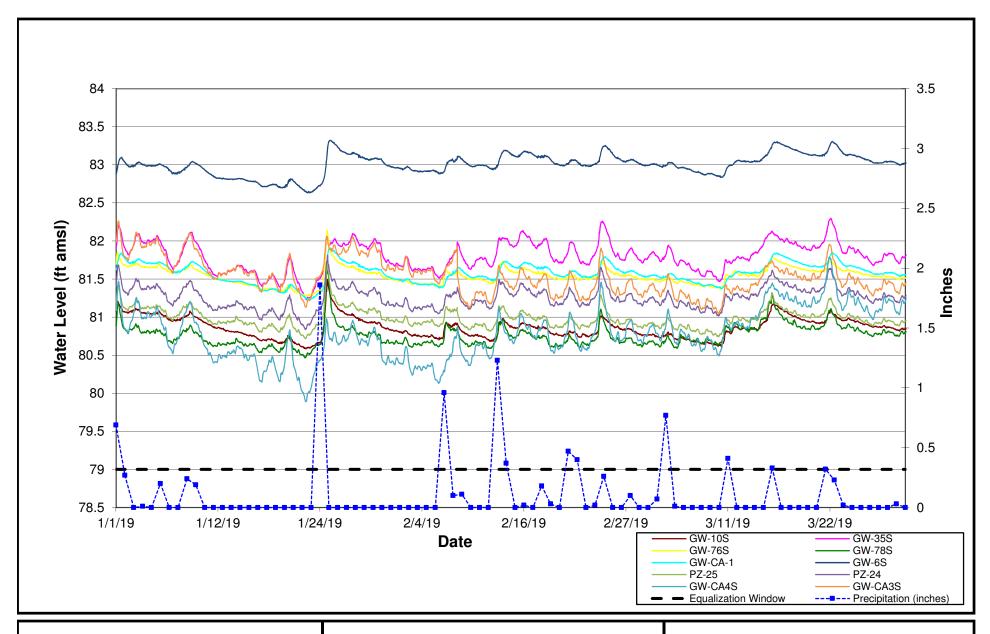
Iron Concentrations in Shallow Sediment (0-0.5 feet)

wood.

Appendix E

Slurry Wall/Cap Data Logger Water Level Plots





wood.

Groundwater Elevation (Corrected for Barometric Pressure) and Precipitation First Quarter 2019

Figure E-2